



Khalda Petroleum Company				Petrofac			
Project: Salam Gas Trains 3 & 4 (SGT3 & 4) Project							
Location: Egypt							
Client's Project No.:		1820		Petrofac Project No.:		JI-187	

## HAZID CLOSE-OUT REPORT

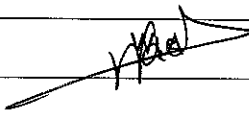
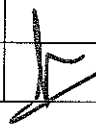
Petrofac International Ltd	
Doc. No.	1820-SA3-00-EHS-RPT-007
Revision	1
Date	18/10/2007
File Ref.	<u>\\shjfiler6\ji187\HSE\HAZID\1820-SA3-00-EHS-RPT-007</u>



## Revision History

Rev	Date	Description of Change
0	29/07/2007	Issued for Information
1	18/10/2007	Reissued for Information

Approval Authority: (Project Manager / Project Engineering Manager)

Owner	Developer	Reviewer	Approver
GSN	BS		 BK/GSN

Summary / Holds      None

## INDEX

1.0	INTRODUCTION.....	4
2.0	SUMMARY .....	4

## APPENDICES

Appendix I	List & Status of HAZID Study Actions
Appendix II	Material Safety Data Sheets



## 1.0 INTRODUCTION

A detailed Hazard Identification (HAZID) workshop for the Salam Gas Trains 3&4 Project (SGT 3&4) of Khalda Petroleum Company (KPC) was conducted on 26th December 2006 and on 3rd January 2007 by Petrofac International Limited (PIL), Sharjah.

The HAZID study Report document no. JI-1820-SA3-00-EHS-RPT-001 Rev B was submitted to KPC and approved. This HAZID CLOSE-OUT REPORT provides close-out responses for each of the action points identified in the HAZID workshop.

## 2.0 SUMMARY

The HAZID study identified 40 Actions. List and status of individual actions along with the responses are given in the following pages (Refer Appendix-1).

The present status of Actions identified in HAZID is:

- |   |      |
|---|------|
| ○ Total Actions from HAZID              | : 40 |
| ○ Actions assigned to Company (KPC)     | : 11 |
| Closed (Resolved) Actions by Company    | : 10 |
| Open Actions by Company                 | : 01 |
| ○ Actions assigned to Contractor( PIL)  | : 29 |
| Closed (Resolved) Actions by Contractor | : 29 |
| Open Actions by Contractor              | : 0  |

10 of the 11 actions assigned to Company are closed and one is still in progress.

All of the 29 actions assigned to contractor are closed.

As all the HAZID study actions are transferred into this CLOSE-OUT REPORT, the HAZID Report document no. JI-1820-SA3-00-EHS-RPT-001 Rev B is now considered closed.

**Appendix-1 List & Status of HAZID Study Actions**  
(4 Pages)



Action Closed	
Action Open	

### List & Status of HAZID Study Actions

Actions	By	Response	Action Status
1. Air inlet filters to be cleaned as per appropriate operating and maintenance procedures for extreme climatic like sand storm	KPC	KPC closed this issue by ordering as per vendor suggestion.	Closed
2. Optical F&G devices to be cleaned	KPC	KPC Closed this issue by ordering as per vendor suggestion.	Closed
3. KPC to review mitigating measures for the potential damage to the facility / personnel from man made hazard	KPC	KPC Covered this item as per contingency plan.	Closed
4. KPC to confirm that construction/camp areas are clear of mines	KPC	KPC Confirmed.	Closed
5. Evaluate risk from flare radiation and dispersion as per project flare design philosophy	PIL(HSE)	Flare Radiation &Dispersion Report is submitted to KPC, refer to Doc. No. 1820-SA3-74-EHS-RPT-003.	Closed
6. Identify sterile area and plant fence	PIL(HSE)	Flare Radiation &Dispersion Report is submitted to KPC, refer to Doc. No. 1820-SA3-74-EHS-RPT-003.	Closed
7. Company to confirm the new site area is free of underground services	KPC	KPC Confirmed.	Closed
8. Project to review journey distance between accommodation and site	PIL(Project)	Distance will be 1.5-2.0 Km from the plant.	Closed
9. Access to site to be reviewed during construction	PIL(Construction)	Access to the site shall be covered in the construction plan.	Closed

<b>Actions</b>	<b>By</b>	<b>Response</b>	<b>Action Status</b>
10. Develop health management plan	PIL(HSE)	The health management plan has been broken down into 4 parts, emergency preparedness and response plan, medical evacuation plan, site emergency contact list and site emergency response plan, and these have been completed and issued.	Closed
11. Maintenance Access will be reviewed by 3D model review	PIL(Project/ Piping)	3D Model review completed with the company. Any additional requirement will be incorporated as per the accepted comments.	Closed
12. Area classification design to be performed as per project specification	PIL(HSE)	Refer to hazardous area classification layout Doc. No. 1820-SA3-74-EHS-SCH-001.	Closed
13. Establish a design basis for consequence modelling	PIL(HSE)	Consequence analysis report is submitted to KPC establishing design basis, refer to Doc. No. 1820-SA3-74-EHS-RPT-004.	Closed
14. 3D model to review fire fighting equipment access and escape route	PIL(Piping/HSE)	Fire fighting facilities and escape route has been reviewed during 3D Model review.	Closed
15. Overall emergency and evacuation and rescue plan a to be developed by KPC	KPC	KPC is in the progress of updating emergency & evacuation plan.	Open
16. Carry out HAZOP and SIL study	PIL(Project)	HAZOP and SIL studies are completed.	Closed
Hydrate formation report to be developed for low temp. condition like winter,...etc	PIL(Process)	Hydrate formation report was issued on 02/04/2007.	Closed
17. Company to keep monitoring of the feed composition for process hazards	KPC	KPC confirmed to keep monitoring of the feed composition	Closed

<b>Actions</b>	<b>By</b>	<b>Response</b>	<b>Action Status</b>
18. HAZOP to be performed for process hazards	PIL(Project)	HAZOP study completed.	Closed
19. 3D model to be reviewed for checking the operation and maintenance adequacy	PIL(Project)	3D Model review completed with the company, any additional requirement will be incorporated as per the accepted comments.	Closed
20. Human factor engineering during 3D model design review	PIL(Piping)	Covered during 3D Model review	Closed
21. Operation / maintenance / control philosophy to be developed	PIL(Process)	Process Control Philosophy Doc. No. 1820-SA3-00-EPR-DBP-012 is already issued. Operating and Commissioning Philosophy Doc. No. 1820-SA3-00-EPR-DBP-005 is already issued.	Closed
22. Company to provide manning philosophy for impact on control/operating philosophy	KPC	KPC Manpower study is O.K, recruitments in progress.	Closed
23. Method statement to be developed to manage each tie- in	PIL(Construction)	Covered in Construction HSE plan, shall be covered in the method	Closed
24. HAZCON to be performed to address construction hazards due to tie-ins	PIL(Construction)	Covered, HAZCON report is issued moreover shall be covered in the method statement.	Closed
25. HAZCON to address radiation concerns during NDT	PIL(Construction)	Covered, HAZCON report is issued; also procedure No. 1820-SA3-00-CON-PRO-036 will be issued.	Closed
26. HAZCON to be performed to address all construction hazards	PIL(Construction)	Covered, HAZCON report is issued.	Closed
27. HAZCON to be performed for further hazards	PIL(Construction)	Covered, HAZCON report is issued	Closed



<b>Actions</b>	<b>By</b>	<b>Response</b>	<b>Action Status</b>
28. Emergency and evacuation plan to be developed	PIL(Construction/HSE)	Covered in construction HSE plan.	Closed
29. Company to manage permit to work issues and interfaces for working inside existing plant area	KPC	KPC available.	Closed
30. HAZCON to address escape concerns	PIL(Construction)	Reviewed during HAZCON.	Closed
31. Company to develop overall evacuation and rescue procedures and identify muster point location	KPC	Covered, HAZCON report is issued	Closed
32. Review emergency lighting requirements for escape routes as per electrical design basis	PIL(Electrical)	This requirement is being taken care in preparation of lighting layout.	Closed
33. HAZCON to address vessel entry, working in confined spaces during construction	PIL(Construction)	Covered, HAZCON report is issued. PTW system will be followed.	Closed
34. Ensure MSDS requirements are adhered	PIL(HSE/Construction)	Done, MSDS are adhered (see appendix II).	Closed
35. Verify access, platforms during 3D model review	PIL(Piping)	Covered during 3D Model review	Closed
36. Company to have EIA in place to take care of environmental issues	KPC	KPC prepared the required EIA study and submitted to PIL.	Closed
37. Noise mapping study to be performed	PIL(HSE)	Noise Mapping study is completed; refer to Doc. No. 1820-SA3-74-EHS-RPT-006.	Closed
38. Review provision of spill curb beneath diesel day tank	PIL(Piping)	Spill curb will be provided beneath diesel day tank.	Closed
39. Review the requirements of fire trap near API separator for open drain system	PIL(Process)	Each drain connections to open drain tank is provided with a dip pipe immersed in the liquid. This acts as a fire trap.	Closed

**Appendix II      Chemicals Material Safety Data Sheets**  
**(12 Data Sheets)**



## **MSDS for SODIUM HYPOCHLORITE**

### **PRODUCT INFORMATION**

Sodium Hypochlorite (NaOCl) is a pale greenish liquid also known as soda bleach or liquid bleach. It is prepared by reacting dilute caustic soda solution with liquid or gaseous chlorine accompanied by cooling.

Chemical Reactions:  $\text{Cl}_2 + 2\text{NaOH} \rightarrow \text{NaOCl} + \text{NaCl} + \text{H}_2\text{O} + \text{Heat}$

### **PROPERTIES/SPECIFICATIONS**

pH 12

Specific gravity 1.10 to 1.12 at 200° C

Solubility Soluble in cold water, decomposes in hot water.

Available Chlorine 7% to 7.5% with excess hydroxide of 7 to 10 grams per liter. Typical Inchem product gives 6.5% available chlorine with 6% as the guaranteed minimum under storage conditions.

### **STORAGE**

Store in cool, dark place. Avoid heat, light and contamination with heavy metals and elements that alter the pH of the solution. In general, containers should be vented to avoid pressure building up due to oxygen formed during decomposition. Opaque containers help reduce such pressure buildup. At lower concentrations, eg., 3% to 6% available chlorine, sodium Hypochlorite solutions are more stable and may be stored longer. For bulk storage, use alkali-resistant FRP, high density polyethylene, or concrete tanks. For smaller-volume storage, use plastic carboys or drums, glass or plastic bottles, glass lined steel, fiberglass, polyester, or tile lined steel containers should be opaque. Handling Strong sodium Hypochlorite solutions are powerful oxidizing agents that rapidly produce burns when in contact with the skin. Do not handle directly or allow the solution to splash or spill on any part of the body. Avoid accidental mixing with acids, as this will liberate chlorine gas. With ammonia or ammonium compounds, explosive products may be formed. Certain organic compounds like acetone and formaldehyde react vigorously with sodium Hypochlorite solutions. Similarly organic contamination of any kind is liable to cause decomposition, which is especially dangerous with strong Hypochlorite solutions.

### **USES OF SODIUM HYPOCHLORITE**

Common Uses

Bleaching Oxidation

Disinfection Coagulation

Odor Control Precipitation

Chlorination of drinking and process water Septicization

Elimination of slime and algae in swimming pool and boiler water pH

Adjustment

Dehairing (in leather industries)

### **USER INDUSTRIES/ESTABLISHMENTS**

Poultryies Bottling

Piggeries Wood Processing

Dairies Laundries

Food Processors Hospitals

Petroleum Refineries Hotels/Motels  
Oil Refineries Households  
Textile industry Waste and sewage treatment  
Pulp and Paper Industry Boiler maintenance services  
Soap Manufacturing

### **TYPICAL APPLICATIONS**

Chlorination of Drinking water

To obtain a chlorine level of 0.5 ppm for potable water supply, sodium Hypochlorite (6% available chlorine solution) may be proportioned as follows: cu m of water x 40 = cc of NaOCl needed thus. 1 cu m H<sub>2</sub>O requires 40 cc of NaOCl to get 0.5 ppm

### **FOR LARGE QUANTITIES**

Mix 40 cc of NaOCl per cu.m of water (equivalent to about 8 teaspoonfuls per cu.m of water) or mix 8 cc of NaOCl per 200 liter drum of water (equivalent to about 1-1/2 teaspoonful per drum of water.

### **FOR SMALL QUANTITIES**

Step 1.

Mix 1 part by volume of NaOCl to 5 parts of water. This will provide a dilute 1% solution.

Step 2.

Add 5cc (1 teaspoonful) of the dilute 1% solution to every 5gallon of water.

For large or small quantities, let the newly chlorinated water stand for 20 to 30 minutes before drinking.

### **CHLORINATION OF SWIMMING POOL**

Use 40cc of 6% Sodium Hypochlorite per cubic meter of water. One liter of Sodium Hypochlorite will disinfect 25 cu.m of swimming pool water. To apply, dilute the sodium Hypochlorite by mixing one part by volume of the chemical to 5 parts of water, then inject the dilute solution through the pump or sprinkle manually around the pool.

### **DRINKING WATER FOR POULTRY/LIVESTOCK**

Drinking water of poultry and pigs should be chlorinated to prevent water-borne diseases. Use the same proportions as those indicated under "Chlorination of Drinking Water", above: viz. 40cc per cu.m of water.

### **SANITATION**

Animal pens  
Wastes and garbage  
Floors of Food processing Plants  
Toilets and Bathrooms

Equipment and instruments  
Instrument rooms  
Poultry houses

Step 1.

Prepare a 60 ppm solution using any of the following proportions: 1cc of 6% NaOCL for every liter of water or 2 teaspoonful (10cc) of NaOCL for every 10 liters of water or 4 teaspoonful (20cc) of NaOCL for a 5 gallon canful of water.

Step 2.

Spray the solution on the items, walls, floors, wastes or garbage to be disinfected. Allow about 2 minutes of contact time for the solution to sanitize completely. Small instruments may be disinfected by immersing in the solution. To neutralize strong odors, as in garbage, double the concentration of the spray solution.

**WARNING: THE SOLUTION IS CAPABLE OF BLEACHING COLORED FABRICS AND PAINTS.**

**BLEACHING OF CLOTH (HOUSEHOLD AND LAUNDRY)**

Step 1.

Prepare a 30ppm solution by adding 2 teaspoonful of 6% Hypochlorite for every 5 gallon

Step 2. Soak the cloth for about 15 minutes.

Control of Bacteria and Slime in Industrial Water

Sodium Hypochlorite can be used to control bacteria and slime in process water for beverages, canning and other food processing industries. The addition of 40cc to 80cc of 6% sodium Hypochlorite per cubic meter of water controls slimes, tubercules and larva stages of larger organisms. Aside from bacterial and slime control, the chlorine in the sodium Hypochlorite also oxidizes the iron and manganese in the water and destroys sulfur dioxide and ammonia. Usually, the amount of Hypochlorite needed for industrial waters is determined by analysis, to establish that level so that after contact of about 20 minutes there is residual chlorine of 0.5 to 2.0ppm

**I. CHEMICAL IDENTIFICATION**

Trade Name	- Liquid Bleach, Soda Bleach
Chemical Name	- Sodium hypochlorite
Chemical formula	- NaOCl
Concentration	
in water solution	- 5 to 7% Available chlorine
CAS No.	- 7681-52-9

**II. PHYSICAL CHARACTERISTICS**

Boiling Point	- 1200° C
Freezing Point	- 8.60° C
Specific gravity	- 1.11 - 1.2 @ 250° C
Appearance	- Clear pale yellow solution with Chlorine odor.

**III. REGULATORY INFORMATION**

TSCA - CAS No.	: 7681-52-9
ID No.	: NA-1791 (RO)
DOT Hazard class	: Corrosive Material

LEAKS - should be repaired immediately. Leaks in tanks, pipe valves, etc. should be flush with large quantity of water to dilute the solution.

DISPOSAL - dilute sodium hypochlorite should be flushed out with plenty of water to reduce available chlorine content to less than 20 ppm level. If necessary neutralize with solution of sodium sulfite, sodium sulfide or sodium thiosulfate.

#### **IX. SPECIAL PRECAUTIONS AND ADDITIONAL INFORMATION**

1. Sodium hypochlorite is a strong oxidizing agent. Do not mix with reducing agents such as rags, wood fibers, paper debris, etc. or with reducing chemicals except under controlled conditions. Do not discard concentrated sodium hypochlorite indiscriminately. A spontaneous combustion fire could result.
2. Do not mix acids, ammonia or any ammoniated chemicals (such as amines). Chlorine which is hazardous gas will be released.
3. Store in corrosion resistant tanks such as hard rubber lined steel tanks, PVC, Polyethylene, FRP and other plastic tanks. Heavy metal pick-up in sodium hypochlorite solution will decompose the sodium hypochlorite solution will decompose the sodium hypochlorite causing evolution of oxygen.

Sodium hypochlorite is an oxidizing agent.

#### **IV. PHYSICAL HAZARDS**

Flash point	:	NA
Flammable limits in air	:	Non combustible
Extinguishant	:	Water
Oxidant	:	Corrosive solution

#### **V. HEALTH HAZARD**

Sodium hypochlorite contains chlorine. Inhalation of fumes is to be avoided as it may cause respiratory irritation. Strong sodium hypochlorite solutions are powerful oxidizing agents that slowly produce burns when in contact with the skin. Inhalation may cause burns on mouth, throat and stomach.

#### **VI. EMERGENCY FIRST AID**

**EYE CONTACT** - Immediately flush eyes with directed stream of water for at least 15 minutes while forcibly holding eyelids apart to insure complete irrigation of all eye and lid tissue.

**SKIN CONTACT** - Flush exposed areas with plenty of water for at least 15 mins.

**INHALATION** - Removed to fresh air and have the victim drink milk, milk of magnesia or small amount of brandy.

**INGESTION** - If swallowed and victim is conscious, have victim drink water, brandy or milk. Do not give vinegar or fruit juices because they are acidic. Do not induce vomiting. If swallowed and victim is unconscious or having convulsions, keep victim warm and get medical help immediately.

#### **VII. PROTECTIVE EQUIPMENT**

**VENTILATION** - Storage and working area should be well ventilated. Local exhausts are necessary to suck any fumes.

**CLOTHING** - Appropriate clothing to prevent the solutions contact with skin.

**EYE PROTECTION** - Normally no fumes but to avoid contacts with eyes, wear goggles and face shield when handling.

**HAND PROTECTION** - Rubber gloves must be used to avoid skin contact.

#### **VIII. SPILLS, LEAKS AND DISPOSAL PROCEDURES**

**SPILLS** - flush with water to dilute the solution. Neutralize with Sodium Sulfide, Sodium Sulfite, or Sodium thiosulfate solution.

# Material Safety Data Sheet

## Methyl Alcohol, Reagent ACS, 99.8% (GC)

ACC# 95294

### Section 1 - Chemical Product and Company Identification

**MSDS Name:** Methyl Alcohol, Reagent ACS, 99.8% (GC)**Catalog Numbers:** AC423950000, AC423950010, AC423950020, AC423955000, AC9541632, AC423952**Synonyms:** Carbinol; Methanol; Methyl hydroxide; Monohydroxymethane; Pyroxylic spirit; Wood alcohol; Wood naptha; Wood spirit; Monohydroxymethane; Methyl hydrate.**Company Identification:**

Acros Organics N.V.

One Reagent Lane

Fair Lawn, NJ 07410

**For information in North America, call:** 800-ACROS-01**For emergencies in the US, call CHEMTREC:** 800-424-9300

### Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
67-56-1	Methyl alcohol	99+	200-659-6

**Hazard Symbols:** T F**Risk Phrases:** 11 23/24/25 39/23/24/25

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

Appearance: clear, colorless. Flash Point: 11 deg C. Poison! Cannot be made non-poisonous. Causes eye and skin irritation. May be absorbed through intact skin. This substance has caused adverse reproductive and fetal effects in animals. **Danger! Flammable liquid and vapor.** Harmful if inhaled. May be fatal or cause blindness if swallowed. May cause central nervous system depression. May cause digestive tract irritation with nausea, vomiting, and diarrhea. Causes respiratory tract irritation. May cause liver, kidney and heart damage.

**Target Organs:** Kidneys, heart, central nervous system, liver, eyes.**Potential Health Effects****Eye:** Produces irritation, characterized by a burning sensation, redness, tearing, inflammation, and possible corneal injury. May cause painful sensitization to light.**Skin:** Causes moderate skin irritation. May be absorbed through the skin in harmful amounts. Prolonged and/or repeated contact may cause defatting of the skin and dermatitis.**Ingestion:** May be fatal or cause blindness if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause systemic toxicity with acidosis. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. May cause cardiopulmonary system effects.**Inhalation:** Harmful if inhaled. May cause adverse central nervous system effects including headache, convulsions, and possible death. May cause visual impairment and possible permanent blindness. Causes irritation of the mucous membrane.**Chronic:** Prolonged or repeated skin contact may cause dermatitis. Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. Chronic exposure



may cause reproductive disorders and teratogenic effects. Laboratory experiments have resulted in mutagenic effects. Prolonged exposure may cause liver, kidney, and heart damage.

## Section 4 - First Aid Measures

**Eyes:** Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

**Skin:** Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

**Ingestion:** If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately. Induce vomiting by giving one teaspoon of Syrup of Ipecac.

**Inhalation:** Get medical aid immediately. Remove from exposure to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

**Notes to Physician:** Effects may be delayed. Ethanol may inhibit methanol metabolism.

## Section 5 - Fire Fighting Measures

**General Information:** Containers can build up pressure if exposed to heat and/or fire. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Flammable Liquid. Can release vapors that form explosive mixtures at temperatures above the flashpoint. Use water spray to keep fire-exposed containers cool. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. May be ignited by heat, sparks, and flame.

**Extinguishing Media:** For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. For large fires, use water spray, fog or alcohol-resistant foam. Do NOT use straight streams of water.

## Section 6 - Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Scoop up with a nonsparking tool, then place into a suitable container for disposal. Use water spray to disperse the gas/vapor. Remove all sources of ignition. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Do not use combustible materials such as saw dust. Provide ventilation. A vapor suppressing foam may be used to reduce vapors. Water spray may reduce vapor but may not prevent ignition in closed spaces.

## Section 7 - Handling and Storage

**Handling:** Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Do not breathe dust, vapor,

mist, or gas. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with heat, sparks and flame. Do not ingest or inhale. Use only in a chemical fume hood. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

**Storage:** Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. Keep containers tightly closed. Do not store in aluminum or lead containers.

## Section 8 - Exposure Controls, Personal Protection

**Engineering Controls:** Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits. Use only under a chemical fume hood.

### Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Methyl alcohol	200 ppm TWA; 250 ppm STEL; skin - potential for cutaneous absorption	200 ppm TWA; 260 mg/m <sup>3</sup> TWA 6000 ppm IDLH	200 ppm TWA; 260 mg/m <sup>3</sup> TWA

**OSHA Vacated PELs:** Methyl alcohol: 200 ppm TWA; 260 mg/m<sup>3</sup> TWA; 250 ppm STEL; 325 mg/m<sup>3</sup> STEL

### Personal Protective Equipment

**Eyes:** Wear chemical goggles.

**Skin:** Wear appropriate protective gloves to prevent skin exposure.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

**Respirators:** A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

## Section 9 - Physical and Chemical Properties

**Physical State:** Liquid

**Appearance:** clear, colorless

**Odor:** alcohol-like - weak odor

**pH:** Not available.

**Vapor Pressure:** 128 mm Hg @ 20 deg C

**Vapor Density:** 1.11 (Air=1)

**Evaporation Rate:** 5.2 (Ether=1)

**Viscosity:** 0.55 cP 20 deg C

**Boiling Point:** 64.7 deg C @ 760.00 mm Hg

**Freezing/Melting Point:** -98 deg C

**Autoignition Temperature:** 464 deg C ( 867.20 deg F)

**Flash Point:** 11 deg C ( 51.80 deg F)

**Decomposition Temperature:** Not available.

**NFPA Rating:** (estimated) Health: 1; Flammability: 3; Reactivity: 0

**Explosion Limits, Lower:** 6.0 vol %

**Upper:** 36.00 vol %

**Solubility:** miscible

**Specific Gravity/Density:** 0.7910 g/cm<sup>3</sup>

**Molecular Formula:** CH<sub>4</sub>O

**Molecular Weight:** 32.04

## Section 10 - Stability and Reactivity

**Chemical Stability:** Stable under normal temperatures and pressures.

**Conditions to Avoid:** High temperatures, incompatible materials, ignition sources, oxidizers.

**Incompatibilities with Other Materials:** Acids (mineral, non-oxidizing, e.g. hydrochloric acid, hydrofluoric acid, muriatic acid, phosphoric acid), acids (mineral, oxidizing, e.g. chromic acid, hypochlorous acid, nitric acid, sulfuric acid), acids (organic, e.g. acetic acid, benzoic acid, formic acid, methanoic acid, oxalic acid), azo, diazo, and hydrazines (e.g. dimethyl hydrazine, hydrazine, methyl hydrazine), isocyanates (e.g. methyl isocyanate), nitrides (e.g. potassium nitride, sodium nitride), peroxides and hydroperoxides (organic, e.g. acetyl peroxide, benzoyl peroxide, butyl peroxide, methyl ethyl ketone peroxide), epoxides (e.g. butyl glycidyl ether), Oxidants (such as barium perchlorate, bromine, chlorine, hydrogen peroxide, lead perchlorate, perchloric acid, sodium hypochlorite), Active metals (such as potassium and magnesium), acetyl bromide, alkyl aluminum salts, beryllium dihydride, carbontetrachloride, carbon tetrachloride + metals, chloroform + heat, chloroform + sodium hydroxide, cyanuric chloride, diethyl zinc, nitric acid, potassium-tert-butoxide, chloroform + hydroxide, water reactive substances (e.g. acetic anhydride, alkyl aluminum chloride, calcium carbide, ethyl dichlorosilane).

**Hazardous Decomposition Products:** Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, formaldehyde.

**Hazardous Polymerization:** Will not occur.

## Section 11 - Toxicological Information

**RTECS#:**

**CAS# 67-56-1:** PC1400000

**LD50/LC50:**

**CAS# 67-56-1:**

Draize test, rabbit, eye: 40 mg Moderate;

Draize test, rabbit, eye: 100 mg/24H Moderate;

Draize test, rabbit, skin: 20 mg/24H Moderate;

Inhalation, rat: LC50 = 64000 ppm/4H;

Oral, mouse: LD50 = 7300 mg/kg;

Oral, rabbit: LD50 = 14200 mg/kg;

Oral, rat: LD50 = 5628 mg/kg;

Skin, rabbit: LD50 = 15800 mg/kg;

**Carcinogenicity:**

**CAS# 67-56-1:** Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

**Epidemiology:** Methanol has been shown to produce fetotoxicity in the embryo or fetus of laboratory animals. Specific developmental abnormalities include cardiovascular, musculoskeletal, and urogenital systems.

**Teratogenicity:** Effects on Newborn: Behavioral, Oral, rat: TDLo=7500 mg/kg (female 17-19 days after conception). Effects on Embryo or Fetus: Fetotoxicity, Inhalation, rat: TCLo=10000 ppm/7H (female 7-15 days after conception). Specific Developmental Abnormalities: Cardiovascular, Musculoskeletal, Urogenital, Inhalation, rat: TCLo=20000 ppm/7H (7-14 days after conception).

**Reproductive Effects:** Paternal Effects: Spermatogenesis: Intraperitoneal, mouse TDLo=5 g/kg (male 5 days pre-mating). Fertility: Oral, rat: TDLo = 35295 mg/kg (female 1-15 days after conception). Paternal Effects: Testes, Epididymis, Sperm duct: Oral, rat: TDLo = 200 ppm/20H (male 78 weeks pre-mating).

**Neurotoxicity:** No information available.

**Mutagenicity:** DNA inhibition: Human Lymphocyte = 300 mmol/L. DNA damage: Oral, rat = 10 umol/kg. Mutation in microorganisms: Mouse Lymphocyte = 7900 mg/L. Cytogenetic analysis: Oral, mouse = 1 gm/kg.

**Other Studies:** Standard Draize Test (Skin, rabbit) = 20 mg/24H (Moderate) Standard Draize

Test: Administration into the eye (rabbit) = 40 mg (Moderate). Standard Draize test:  
Administration into the eye (rabbit) = 100 mg/24H (Moderate).

## Section 12 - Ecological Information

**Ecotoxicity:** Fish: Fathead Minnow: 29.4 g/L; 96 Hr; LC50 (unspecified) Goldfish: 250 ppm; 11 Hr; resulted in death Rainbow trout: 8000 mg/L; 48 Hr; LC50 (unspecified) Rainbow trout: LC50 = 13-68 mg/L; 96 Hr.; 12 degrees C Fathead Minnow: LC50 = 29400 mg/L; 96 Hr.; 25 degrees C, pH 7.63 Rainbow trout: LC50 = 8000 mg/L; 48 Hr.; Unspecified via: Phytobacterium phosphoreum: EC50 = 51,000-320,000 mg/L; 30 minutes; Microtox test No data available.

**Environmental:** Dangerous to aquatic life in high concentrations. Aquatic toxicity rating: TLM 96 > 1000 ppm. May be dangerous if it enters water intakes. Methyl alcohol is expected to biodegrade in soil and water very rapidly. This product will show high soil mobility and will be degraded from the ambient atmosphere by the reaction with photochemically produced hydroxyl radicals with an estimated half-life of 17.8 days. Bioconcentration factor for fish (golden ide) < 10. Based on a log Kow of -0.77, the BCF value for methanol can be estimated to be 0.2.

**Physical:** No information available.

**Other:** None.

## Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

**RCRA P-Series:** None listed.

**RCRA U-Series:** CAS# 67-56-1: waste number U154; (Ignitable waste).

## Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
<b>Shipping Name:</b>	METHANOL				METHANOL
<b>Hazard Class:</b>	3				3(6.1)
<b>UN Number:</b>	UN1230				UN1230
<b>Packing Group:</b>	II				II
<b>Additional Info:</b>					FLASHPOINT 11 C

## Section 15 - Regulatory Information

### US FEDERAL

#### TSCA

CAS# 67-56-1 is listed on the TSCA Inventory.

#### Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

#### Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

#### Section 12b

None of the chemicals are listed under TSCA Section 12b.

#### TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

**SARA**

**Section 302 (RQ)**

CAS# 67-56-1: final RQ = 5000 pounds (2270 kg)

**Section 302 (TPQ)**

None of the chemicals in this product have a TPQ.

**SARA Codes**

CAS # 67-56-1: acute, flammable.

**Section 313**

This material contains Methyl alcohol (CAS# 67-56-1, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

**Clean Air Act:**

CAS# 67-56-1 is listed as a hazardous air pollutant (HAP). This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

**Clean Water Act:**

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

**OSHA:**

None of the chemicals in this product are considered highly hazardous by OSHA.

**STATE**

CAS# 67-56-1 can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed.

**European/International Regulations**

**European Labeling in Accordance with EC Directives**

**Hazard Symbols:**

T F

**Risk Phrases:**

R 11 Highly flammable.

R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.

R 39/23/24/25 Toxic : danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.

**Safety Phrases:**

S 16 Keep away from sources of ignition - No smoking.

S 36/37 Wear suitable protective clothing and gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 7 Keep container tightly closed.

**WGK (Water Danger/Protection)**

CAS# 67-56-1: 1

**Canada**

CAS# 67-56-1 is listed on Canada's DSL List. CAS# 67-56-1 is listed on Canada's DSL List. This product has a WHMIS classification of B2, D1A, D2B.

CAS# 67-56-1 is listed on Canada's Ingredient Disclosure List.

**Exposure Limits**

CAS# 67-56-1: OEL-ARAB Republic of Egypt:TWA 200 ppm (260 mg/m3);Skin OEL-AUSTRALIA:TWA 200 ppm (260 mg/m3);STEL 250 ppm;Skin OEL-BELGIUM:TWA 200 ppm (262 mg/m3);STEL 250 ppm;Skin OEL-CZECHOSLOVAKIA:TWA 100 mg/m3;STEL 500 mg/m3 OEL-DENMARK:TWA 200 ppm (260 mg/m3);Skin OEL-FINLAND:TWA 200 ppm (260 mg/m3);STEL 250 ppm;Skin OEL-FRANCE:TWA 200 ppm (260 mg/m3);STEL 1000 ppm (1300 mg/m3) OEL-GERMANY:TWA 200 ppm (2

60 mg/m<sup>3</sup>);Skin OEL-HUNGARY:TWA 50 mg/m<sup>3</sup>;STEL 100 mg/m<sup>3</sup>;Skin JAN9 OEL -JAPAN:TWA 200 ppm (260 mg/m<sup>3</sup>);Skin OEL-THE NETHERLANDS:TWA 200 ppm (260 mg/m<sup>3</sup>);Skin OEL-THE PHILIPPINES:TWA 200 ppm (260 mg/m<sup>3</sup>) OEL-POLAND:TWA 100 mg/m<sup>3</sup> OEL-RUSSIA:TWA 200 ppm;STEL 5 mg/m<sup>3</sup>;Skin OEL-SWEDEN :TWA 200 ppm (250 mg/m<sup>3</sup>);STEL 250 ppm (350 mg/m<sup>3</sup>);Skin OEL-SWITZERLAND:TWA 200 ppm (260 mg/m<sup>3</sup>);STEL 400 ppm;Skin OEL-THAILAND:TWA 200 ppm (260 mg/m<sup>3</sup>) OEL-TURKEY:TWA 200 ppm (260 mg/m<sup>3</sup>) OEL-UNITED KINGDOM:TWA 200 ppm (260 mg/m<sup>3</sup>);STEL 250 ppm;Skin OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

## Section 16 - Additional Information

**MSDS Creation Date:** 7/21/1999

**Revision #4 Date:** 3/14/2001

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.*



# Coastal 1017-F

## Process Defoamer/Antifoam

### Product Information

Coastal 1017-F is a liquid, non-silicone, polyol-based, organic defoamer/antifoam. The product is effective in reducing foam in amine treating plants and glycol dehydration units.

### Typical Physical Properties

Form	Clear Liquid
Density @ 60° F	8.4 lb/gal (typical)
Flash Point, °F	365° F
Pour Point, °F	-10° F
Viscosity, Centistokes	
75°F	800
100°F	455
210°F	55
Solubility	Water Insoluble, Glycol Insoluble, Oil Soluble

### Application:

Coastal 1017-F can be added in a batch or continuous method, directly into the circulating fluid line or into the reserve vessel. The initial treatment rate will depend upon the immediate severity of the foaming problem. It is normal to begin at a treatment rate of 100 ppmw, not to exceed 400 ppmw in a day. This product is organic but is not significantly removed through carbon filtration.

### Handling Precautions

Coastal 1017-F is an industrial chemical and should be handled as such. Avoid contact with eyes, skin and clothing. In cases of eye contact, flush immediately with water for at least 15 minutes and contact medical help. Person(s) working with this product should read and be familiar with safety precautions detailed in the Material Safety Data Sheet on this product prior to use.

The data presented in this bulletin are typical only and not specifications. The information and suggested uses are based on evaluations believed reliable. No guarantee or warranties are expressed or implied, however, including the implied warranty of merchantability and fitness for particular purpose. Coastal Chemical Co., LLC disclaims any liability in the use of these data, including possible infringement of patent.

Revised, 1-6-04



**Coastal Chemical Co., L.L.C., a Brenntag Company**

5300 Memorial Drive, Suite 250 • Houston, TX 77007 • Phone: 713-865-8787 • Fax: 713-865-8788

# Material Safety Data Sheet

## Section 1. Chemical Product and Company Identification

Common Name	Defoamer 1017-F	Code	40511
Supplier	COASTAL CHEMICAL CO., L.L.C. 3520 Veterans Memorial Drive ABBEVILLE, LA 70510 337-893-3862	MSDS#	Not available.
Synonym	Not available.	Validation Date	05/20/2004
Trade name	Not available.	Print Date	05/20/2004
Material Uses	Not available.	In case of Emergency	Transportation Emergency Call CHEMTREC 800-424-9300 Other Information Call Charles Troups 337-261-0796
Manufacturer	Coastal Chemical Co., Inc. 3520 Charity Street Abbeville, La.		

## Section 2. Composition and Information on Ingredients

Name	CAS #	% by Weight	TLV/PEL	LC <sub>50</sub> /LD <sub>50</sub>
No hazardous ingredient.				

## Section 3. Hazards Identification

Emergency Overview	CAUTION!  MAY CAUSE MILD EYE IRRITATION.
Routes of Entry	Skin contact.
Potential Acute Health Effects	Very slightly to slightly dangerous in case of eye contact (irritant). Non-corrosive for skin. Non-irritant for skin. Non-sensitizer for skin. Non-permeator by skin. Non-hazardous in case of ingestion. Non-hazardous in case of inhalation.
Potential Chronic Health Effects	Very slightly to slightly dangerous in case of eye contact (irritant). Non-corrosive for skin. Non-irritant for skin. Non-sensitizer for skin. Non-hazardous in case of ingestion. Non-hazardous in case of inhalation. <b>CARCINOGENIC EFFECTS:</b> Not available. <b>MUTAGENIC EFFECTS:</b> Not available. <b>TERATOGENIC EFFECTS:</b> Not available. Toxicity of the product to the reproductive system: Not available.

## Section 4. First Aid Measures

Eye Contact	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. COLD water may be used.
Skin Contact	NO known EFFECT on skin contact, rinse with water for a few minutes.
Hazardous Skin Contact	No additional information.
Inhalation	Allow the victim to rest in a well ventilated area. Seek immediate medical attention.
Hazardous Inhalation	No additional information.
Ingestion	

Continued on Next Page



Hazardous Ingestion	Remove dentures if any. Have conscious person drink several glasses of water or milk. INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. NEVER give an unconscious person anything to ingest. Seek medical attention. No additional information.
---------------------	--

**Section 5. Fire and Explosion Data**

Flammability of the Product	Combustible.
Auto-Ignition Temperature	Not available.
Flash Points	OPEN CUP: 199°C (390.2°F)
Flammable Limits	Not available.
Products of Combustion	Not available.
Fire Hazards in Presence of Various Substances	No specific information is available in our database regarding the flammability of this product in presence of various materials.
Explosion Hazards in Presence of Various Substances	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. No specific information is available in our database regarding the product's risks of explosion in the presence of various materials.
Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemicals, CO2, water spray or foam. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet.
Special Remarks on Fire Hazards	No additional remark.
Special Remarks on Explosion Hazards	No additional remark.

**Section 6. Accidental Release Measures**

Small Spill	Dilute with water and mop up, or absorb with an inert DRY material and place in an appropriate waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.
Large Spill	Combustible material. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

**Section 7. Handling and Storage**

Handling	Not available.
Storage	Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Combustible materials should be stored away from extreme heat and away from strong oxidizing agents.

**Section 8. Exposure Controls/Personal Protection**

Engineering Controls	Provide exhaust ventilation or other engeneering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection	Safety glasses. Lab coat. Gloves (impervious).
Personal Protection in Case of a Large Spill	Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Chemical Name or Product Name	CAS # Exposure Limits

Continued on Next Page

No hazardous ingredients.

**Section 9. Physical and Chemical Properties**

Physical state and appearance	Liquid.	Odor	Polyether Odor (Slight.)
Molecular Weight	Not applicable.	Taste	Not available.
pH (1% soln/water)	Not available.	Color	Colorless. (Light.)
Boiling Point	Decomposes.		
Melting Point/Pour Point	Not available.		
Critical Temperature	Not available.		
Specific Gravity	1.002 (Water = 1)		
Vapor Pressure	Not available.		
Vapor Density	>1 (Air = 1)		
Volatility	Not available.		
Odor Threshold	Not available.		
Evaporation rate	Not available.		
Viscosity	Not available.		
Water/Oil Dist. Coeff.	Not available.		
Ionicity (in Water)	Not available.		
Dispersion Properties	See solubility in water.		
Solubility	Partially soluble in cold water, hot water.		
Physical Chemical Comments	Not available.		

**Section 10. Stability and Reactivity Data**

Chemical Stability	The product is stable.
Conditions of Instability	No additional remark.
Incompatibility with various substances	No specific information is available in our database regarding the reactivity of this material in presence of various other materials.
Hazardous Decomposition Products	Not available.
Hazardous Polymerization	No.

**Section 11. Toxicological Information**

Toxicity to Animals	Acute oral toxicity (LD50): >10000 mg/kg (Rat). Acute dermal toxicity (LD50): >30000 mg/kg (Rabbit).
Chronic Effects on Humans	Toxicity of the product to the reproductive system: Not available.
Other Toxic Effects on Humans	Very slightly to slightly dangerous in case of eye contact (irritant). Non-corrosive for skin. Non-irritant for skin. Non-sensitizer for skin. Non-permeator by skin. Non-hazardous in case of ingestion. Non-hazardous in case of inhalation.
Special Remarks on Toxicity to Animals	No additional remark.

Continued on Next Page

Special Remarks on Chronic Effects on Humans No additional remark.

Special Remarks on other Toxic Effects on Humans No additional remark.

### Section 12. Ecological Information

Ecotoxicity Not available.

BOD5 and COD Not available.

Products of Biodegradation Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation Not available.

Special Remarks on the Products of Biodegradation No additional remark.

### Section 13. Disposal Considerations

Waste Disposal Follow local, state, and federal guidelines.

### Section 14. Transport Information

Proper Shipping Name NONE

DOT Classification Not a DOT controlled material (United States).

DOT Identification Number Not applicable

Packing Group NONE

Hazardous Substances Reportable Quantity (kg) Not available.

Special Provisions for Transport Not applicable.

### Section 15. Regulatory Information

Federal and State Regulations Not available.

Other Classifications	WHMIS (Canada)	Not controlled under WHMIS (Canada).
	DSCL (EEC)	Not controlled under DSCL (Europe).

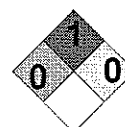
### Section 16. Other Information

HMIS (U.S.A.)

Health Hazard	0
Fire Hazard	1
Reactivity	0
Personal Protection	B

National Fire Protection Association (U.S.A.)

Health



Fire Hazard

Reactivity

Specific hazard

References Not available.

Continued on Next Page

**Other Special**      No additional remark.  
**Considerations**

Validated by Charles Toups on 05/20/2004.

Verified by Charles Toups.

Printed 05/20/2004.

Transportation Emergency Call  
CHEMTREC 800-424-9300  
Other Information Call  
Charles Toups  
337-261-0796

**Notice to Reader**

*To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.*

---

MSDS Number: C0935 \* \* \* \* \* Effective Date: 05/08/03 \* \* \* \* \* Supersedes: 08/25/00

---

**MSDS****Material Safety Data Sheet**

From: Mallinckrodt Baker, Inc.  
222 Red School Lane  
Phillipsburg, NJ 08855



24 Hour Emergency Telephone: 908-659-2151  
CHEMTREC: 1-800-424-9300

National Response In Canada  
CANUTEC: 613-966-6666

Outside U.S. and Canada  
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

---

# CARBON, ACTIVATED, POWDER

---

## 1. Product Identification

**Synonyms:** Charcoal, Activated  
**CAS No.:** 7440-44-0  
**Molecular Weight:** 12.01  
**Chemical Formula:** C  
**Product Codes:**  
J.T. Baker: 3370, 5010, E343  
Mallinckrodt: 3929

---

## 2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Activated Carbon	7440-44-0	90 - 100%	Yes

---

## 3. Hazards Identification

### Emergency Overview

**CAUTION! ACTIVATED CARBON AFFECTS THE RESPIRATORY AND CARDIOVASCULAR SYSTEMS.**

**J.T. Baker SAF-T-DATA<sup>(tm)</sup> Ratings** (Provided here for your convenience)

---

Health Rating: 1 - Slight

Flammability Rating: 1 - Slight

Reactivity Rating: 1 - Slight

Contact Rating: 1 - Slight

Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES

Storage Color Code: Orange (General Storage)

---

**Potential Health Effects**

---

**Inhalation:**

No adverse effects expected. May cause mild irritation to the respiratory tract.

**Ingestion:**

No adverse effects expected. May cause mild irritation to the gastrointestinal tract.

**Skin Contact:**

Not expected to be a health hazard from skin exposure. May cause mild irritation and redness.

**Eye Contact:**

No adverse effects expected. May cause mild irritation, possible reddening.

**Chronic Exposure:**

Prolonged inhalation of excessive dust may produce pulmonary disorders.

**Aggravation of Pre-existing Conditions:**

No information found.

---

## 4. First Aid Measures

**Inhalation:**

Remove to fresh air. Get medical attention for any breathing difficulty.

**Ingestion:**

Give several glasses of water to drink to dilute. If large amounts were swallowed, get medical advice.

**Skin Contact:**

Not expected to require first aid measures. Wash exposed area with soap and water. Get medical advice if irritation develops.

**Eye Contact:**

Wash thoroughly with running water. Get medical advice if irritation develops.

---

## 5. Fire Fighting Measures

**Fire:**

As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source. Activated carbon is difficult to ignite and tends to burn slowly (smolder) without producing smoke or flame. Wet activated carbon depletes oxygen from the air. Materials allowed to smolder for long periods in enclosed spaces, may

produce amounts of carbon monoxide which may reach the lower explosive limit for carbon monoxide of 12.5% in air. Contact with strong oxidizers such as ozone or liquid oxygen may cause rapid combustion.

**Explosion:**

Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Minimum explosible concentration 0.140 g/l.

**Fire Extinguishing Media:**

Water spray, dry chemical, alcohol foam, or carbon dioxide.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

## 6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container. Warning! Spent product may have absorbed hazardous materials.

---

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Keep away from moisture and oxidizers. Avoid dust dispersal. Wet activated carbon depletes oxygen from the air and therefore dangerously low levels of oxygen may be encountered in confined spaces. Work procedures for potentially low oxygen areas should be followed.

Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**

- OSHA Permissible Exposure Limits (PELs):

activated carbon (graphite, synthetic): total particulate = 15 mg/m<sup>3</sup> (TWA), respirable fraction = 5 mg/m<sup>3</sup> (TWA).

- ACGIH Threshold Limit Values (TLVs):

graphite, all forms except graphite fibers: 2 mg/m<sup>3</sup> (TWA).

**Ventilation System:**

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document,

*Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

**Personal Respirators (NIOSH Approved):**

For conditions of use where exposure to the dust or mist is apparent, a half-face dust/mist respirator may be worn. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator.

**WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

**Skin Protection:**

Wear protective gloves and clean body-covering clothing.

**Eye Protection:**

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

## 9. Physical and Chemical Properties

**Appearance:**

Black powder.

**Odor:**

Odorless.

**Solubility:**

Insoluble in water.

**Specific Gravity:**

1.8 - 2.1

**pH:**

5.0-10.0

**% Volatiles by volume @ 21C (70F):**

0

**Boiling Point:**

Sublimes.

**Melting Point:**

3550C (6422F)

**Vapor Density (Air=1):**

0.4

**Vapor Pressure (mm Hg):**

1 @ 3586C (6487F)

**Evaporation Rate (BuAc=1):**

No information found.

---

## 10. Stability and Reactivity

**Stability:**

Stable under ordinary conditions of use and storage.

**Hazardous Decomposition Products:**

Involvement in a fire causes formation of carbon dioxide and carbon monoxide.

**Hazardous Polymerization:**

Will not occur.

**Incompatibilities:**

Strong oxidizers such as ozone, liquid oxygen, chlorine, permanganate, etc. may result



in rapid combustion. Avoid contact with strong acids.

**Conditions to Avoid:**

Moisture and incompatibles.

---

## 11. Toxicological Information

Investigated as a reproductive effector.

-----\Cancer Lists\-----			
Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Activated Carbon (7440-44-0)	No	No	None

---

## 12. Ecological Information

**Environmental Fate:**

No information found.

**Environmental Toxicity:**

No information found.

---

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

## 14. Transport Information

Not regulated.

---

## 15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----				
Ingredient	TSCA	EC	Japan	Australia
Activated Carbon (7440-44-0)	Yes	Yes	No	Yes
-----\Chemical Inventory Status - Part 2\-----				
--Canada--				

Ingredient	Korea	DSL	NDSL	Phil.
Activated Carbon (7440-44-0)	Yes	Yes	No	Yes
-----\Federal, State & International Regulations - Part 1\-----				
	-SARA 302-		-----SARA 313-----	
Ingredient	RQ	TPQ	List	Chemical Catg.
Activated Carbon (7440-44-0)	No	No	No	No
-----\Federal, State & International Regulations - Part 2\-----				
	-RCRA-		-TSCA-	
Ingredient	CERCLA	261.33	8 (d)	
Activated Carbon (7440-44-0)	No	No	No	

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No  
 SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No  
 Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** None allocated.

**Poison Schedule:** None allocated.

**WHMIS:**

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: 0 Flammability: 1 Reactivity: 0

**Label Hazard Warning:**

CAUTION! ACTIVATED CARBON AFFECTS THE RESPIRATORY AND CARDIOVASCULAR SYSTEMS.

**Label Precautions:**

Avoid contact with eyes, skin and clothing.

Avoid breathing dust.

Keep container closed.

Use with adequate ventilation.

Wash thoroughly after handling.

**Label First Aid:**

If inhaled, remove to fresh air. Get medical attention for any breathing difficulty.

**Product Use:**

Laboratory Reagent.

**Revision Information:**

No Changes.

**Disclaimer:**

\*\*\*\*\*

Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving

the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

\*\*\*\*\*

**Prepared by:** Environmental Health & Safety  
Phone Number: (314) 654-1600 (U.S.A.)



# MATERIAL SAFETY DATA SHEET



## SECTION 1 - BASIC INFORMATION

Manufacturers Name : <b>METITO - FZE</b>	Emergency Telephone : 971-06 -5563011 971-06 -263177
Postal Address: <b>Metito (Overseas) Ltd.</b> P.O. Box 22701, SHARJAH, UNITED ARAB EMIRATES.	
Product Name and Synonyms ® <b>SUPERFLOC C-573</b>	Application <b>Coagulant for water/waste water treatment</b>
Hazard Symbol (if any) <b>None</b>	Metito Safety Category : <b>HAZARD CATEGORY - A</b>
Risk Phrases (if any) <b>None</b>	
Safety Phrases (if any) <b>None</b>	

## SECTION 2 - HAZARDOUS INGREDIENTS

Hazardous Substance	% W/W	TLV (Units)
None	-	-

## SECTION 3 - PHYSICAL DATA

Appearance & Odour :	Clear amber - liquid		
Boiling Point	As water	Specific Gravity (H <sub>2</sub> O=1)	1.14 - 1.18
Vapour Pressure (mm Hg.) 13°C:	N/A	%Volatile by volume	N/A
Vapour Density (Air=1):	N/A	Evaporate Rate(H <sub>2</sub> O=1)	N/Ar
Solubility in Water:	Infinite	pH as supplied	4 - 8

## SECTION 4 - FIRE & EXPLOSION HAZARD DATA

Flash Point (Method Used)	: Non-flammable
Extinguishing Media	: Any
Fire Fighting Procedures	: When chemicals are involved in a general fire, large volumes of black smoke or toxic fumes can be liberated, even if the substance is not classified as flammable. Fire fighters should ensure necessary precautions are taken by wearing breathing apparatus, especially if volumes involved are large.
Unusual Fire & Explosion Hazard	: None.

### SECTION 5 - HEALTH HAZARD DATA

Threshold Limit Value : Non-hazardous  
Effect of Overexposures : Non-hazardous  
Emergency & First Aid Procedures : For splashes to cleaning solution in the eye, rinse thoroughly with fresh water to prevent irritation. Skin irritation is seldom a problem, but should soreness occur, then a commercial hand cream will restore the natural skin oils and relieve the condition.

### SECTION 6 - REACTIVITY DATA

Stability : Stable  
Conditions to avoid : See general comments regarding storage in(9) below.  
Incompatible materials : None known  
Hazardous decomposition products : None  
Hazardous polymerisation : None  
Conditions to avoid : See general comments regarding storage in(9) below

### SECTION - 7 SPILL OR LEAK PROCEDURES

Steps to be taken if material is releases or spilled. : Small quantities : Rinse to drain.  
Large quantities: Absorb with sand or absorbent granules and dispose of properly.  
Waste disposal method : Rinse small quantities to drain. Large quantities should be disposed of in accordance with local authority regulations.

### SECTION - 8 SPECIAL PROTECTION INFORMATION

Respiratory Protection(Incl.Type) : None  
Ventilation Local Exhaust : N/A Special : N/A  
Mechanical (General) : N/A Other : N/A  
Protective gloves : Rubber or PVC(see below) Eye Protection : Goggles (see below)  
Other protective equipment : Overalls may be worn in order to protect clothing.

### SECTION 9 - HANDLING & STORAGE

Precautions to be taken in handling an storing : Ensure that the operator is fully informed and familiar with the use of the product. Do not eat, drink or smoke when using chemicals. Avoid skin or eye contact by the use suitable protective equipment. Store in the container provide and ensure that it is always closed after use. Avoid storing near direct heat or in direct sunlight. Do not stack more than two high for extended periods. Ensure the Containers are stored away from thoroughfares where they can be accidentally damaged by vehicles fork lift trucks, etc. Store in a dry place.

Metito - FZE  
Post Box No. 22701,  
Sharjah,  
United Arab Emirates.

LICENCE NO. 023

**METITO**

# MATERIAL SAFETY DATA SHEET

**SECTION 1 - BASIC INFORMATION**

Manufacturers Name : METITO - FZE	Emergency Telephone : 971-06 -5563011 971-06 - 263177
Postal Address: <b>Metito (Overseas) Ltd.</b> P.O. Box 22701, SHARJAH, UNITED ARAB EMIRATES.	
Product Name and Synonyms <b>M-50a</b>	Application <b>Scale Inhibitor</b>
Hazard Symbol (if any) <b>None</b>	Metito Safety Category : <b>A - Non-Hazardous</b>
U.N. No.: <b>Non-Hazardous</b>	IMDG Class : <b>Non-Hazardous</b>
Risk Phrases (if any) <b>None</b>	
Safety Phrases (if any) <b>None</b>	

**SECTION 2 - HAZARDOUS INGREDIENTS**

Hazardous Substance	% W/W	TLV (Units)
None	-	-

**SECTION 3 - PHYSICAL DATA**

Appearance & Odour	Clear, Straw - coloured liquid		
Boiling Point	≥ 100°C	Specific Gravity (H <sub>2</sub> O=1)	1.135 - 1.140
Vapour Pressure (mm Hg.)	N/A	%Volatile by volume	N/A
13°C:			
Vapour Density (Air=1):	N/A	Evaporate Rate(H <sub>2</sub> O=1)	As water
Solubility in Water:	Complete	pH as supplied	6.8 - 7.5

**SECTION 4 - FIRE & EXPLOSION HAZARD DATA**

Flash Point (Method Used)	Non-Hazardous
Extinguishing Media	Any
Fire Fighting Procedures	When chemicals are involved in a general fire, large volumes of black smoke or toxic fumes can be liberated, even if the substance is not classified as flammable. Fire fighters should ensure necessary precautions are taken by wearing breathing apparatus, especially if volumes involved are large.
Unusual Fire & Explosion Hazard	None.

**SECTION 5 - HEALTH HAZARD DATA**

Threshold Limit Value	Non-hazardous
Effect of Overexposures	Non-hazardous
Emergency & First Aid Procedures	For splashes of neat product in the eye, rinse thoroughly with fresh water to prevent irritation. Skin irritation is seldom a problem, but should occur, then a commercial hand cream will restore the natural skin oils and relieve the condition.

**SECTION 6 - REACTIVITY DATA**

Stability	Stable
Conditions to avoid	See general comments regarding storage in(9) below.
Incompatible materials	None known
Hazardous decomposition products	None
Hazardous polymerisation	None
Conditions to avoid	See general comments regarding storage in(9)below

**SECTION - 7 SPILL OR LEAK PROCEDURES**

Steps to be taken if material is released or spilled. : Hose away with cold water to foul sewer or absorb with sand or absorbent granules.
Waste disposal method : Rinse small quantities to drain. Large quantities should be disposed of in accordance with local authority regulations.

**SECTION - 8 SPECIAL PROTECTION INFORMATION**

Respiratory Protection (Incl.Type)	Not required		
Ventilation	Local Exhaust	N/A	Special N/A
	Mechanical (General)	N/A	Other N/A
Protective gloves	Rubber or PVC (see Below	Eye Protection	Goggles (see below)
Other protective equipment	Overalls may be worn in order to protect clothing.		

**SECTION 9 - HANDLING & STORAGE**

Precautions to be taken in handling an storing : Ensure that the operator is fully informed and familiar with the use of the product. Do not eat, drink or smoke when using chemicals. Avoid eye & skin contact by the use suitable protective equipment. Store in the container provided and ensure that it is closed when not in use. Avoid storing near direct heat or in direct sunlight. Do not stack more than two high for extended periods. Ensure the containers are stored away from thoroughfares where they can be accidentally damaged by vehicles, fork lift trucks, etc. Do not store in temperatures below 0°C or above 40°C for prolonged periods.
---

Metito - FZE Post Box No. 22701, Sharjah, United Arab Emirates.	LICENCE NO- 023
--	-----------------

**JM**  
**Johnson Matthey**  
**Catalysts**

**1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING**

**PRODUCT NAME:** 'PURASPEC' 1157

**PRODUCT USE:** Purification of hydrocarbon gas

**Address/Phone No.:** Johnson Matthey Catalysts  
 PO Box No 1  
 Billingham  
 Stockton on Tees  
 TS23 1LB  
 UNITED KINGDOM  
 +44 (0) 1642 523343

**Emergency Phone No.:** +44 (0) 1642 452461

**2. COMPOSITION/INFORMATION ON INGREDIENTS**

**PRODUCT DESCRIPTION**

A mixture of basic copper carbonate, basic zinc carbonate and aluminium oxide

HAZARDOUS INGREDIENT(S)	CAS No.	% (w/w)	Symbol	R Phrases
Basic Copper Carbonate (EC No. 2351136)	012069-69-1	>50	Xn	R22
Aluminium oxide (EC No. 2156916)	001344-28-1			

**3. HAZARDS IDENTIFICATION**

**EC Classification:** Not Classified as Hazardous to Users.

Low toxicity under normal conditions of handling and use.



---

**PRODUCT NAME:** 'PURASPEC' 1157

---

#### 4. FIRST-AID MEASURES

Inhalation: Remove patient from exposure, keep warm and at rest.  
Obtain medical attention if ill effects occur.

Skin Contact: Remove contaminated clothing.  
Wash skin with water.  
If symptoms develop, obtain medical attention.

Eye Contact: Irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 10 minutes.  
Obtain medical attention.

Ingestion: Do not induce vomiting.  
Wash out mouth with water and give 200-300 ml (half a pint) of water to drink.  
Obtain medical attention.

#### Further Medical Treatment

Symptomatic treatment and supportive therapy as indicated.

---

#### 5. FIRE-FIGHTING MEASURES

Discharged material may be pyrophoric (see Process Hazards).

Extinguishing Media:	As appropriate for surrounding materials/equipment.
Fire Fighting Protective Equipment:	Suitable respiratory protection.

---

#### 6. ACCIDENTAL RELEASE MEASURES

Do not allow to enter drains, sewers or watercourses.  
Collect spillages by mechanical means.  
Control dust formation.  
Transfer to a container for disposal or recovery.

---

#### 7. HANDLING AND STORAGE

##### 7.1 HANDLING

Control dust formation.  
Avoid contact with eyes.  
Avoid prolonged skin contact.  
Avoid inhalation of high concentrations of dusts. Atmospheric levels should be controlled in compliance with the occupational exposure limit.

#### Process Hazards

---

**PRODUCT NAME:** 'PURASPEC' 1157

---

In the sulphided form, the material will contain metal sulphides which will make it liable to self-heating in contact with oxygen or air.

Prior to discharge the material may contain residual hydrocarbons or deposited hydrocarbons and should be regarded as potentially pyrophoric. Material used for this duty should be purged free of hydrocarbons and cooled with an inert gas before it is discharged.

This material should not be exposed to a reducing atmosphere. Reduction can result in the evolution of large quantities of heat and once reduced, the material should be regarded as pyrophoric.

Pyrophoric and self-heating materials can act as a source of ignition and should be kept away from combustible materials. Contact with air should be minimised. During discharge it is recommended that foam or dry powder fire extinguishers are available to blanket the material if it self-heats. As a minimum, water sprays should be available to cool the material. The action of water on the reduced material may result in the evolution of small quantities of hydrogen.

The discharged material should be kept away from mineral acids to avoid the generation of hydrogen sulphide. Further advice is given in the Johnson Matthey publication 'Catalyst Handling'.

## 7.2 STORAGE

The material should be stored in sealed containers in accordance with the advice given in the Johnson Matthey publication 'Catalyst Handling'.

---

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Wear suitable gloves and eye/face protection.

Wear suitable respiratory protective equipment if exposure to levels above the occupational exposure limit is likely.

Respirators: Respirator type EN 149:2001 and class FFP2 (medium efficiency)

Gloves: Nitrile rubber is recommended.

Gloves should be changed regularly to avoid permeation problems.

### Occupational Exposure

Limits	LTEL 8hr ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Notes
<b>HAZARDOUS</b>					
<b>INGREDIENT(S)</b>					
Basic copper carbonate	-	-	-	-	Not regulated in UK
Aluminium oxide					
(Total Inhalable Dust)	-	10	-	-	OES
(Respirable Dust)	-	4	-	-	OES

---

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Form:	granules
Colour:	green
Odour:	odourless
Odour Threshold (ppm):	Not applicable.
pH (Value):	Not applicable.
Boiling Point (Deg C):	Not applicable.
Melting Point (Deg C):	No data.
Flash Point (Deg C):	Not applicable.
Flammable Limits:	Not applicable.
Auto Ignition Temperature (Deg C):	Not applicable.
Explosive Properties:	Not applicable.

---

**PRODUCT NAME:** 'PURASPEC' 1157

---

Oxidising Properties:	No data.
Vapour Pressure (mm Hg):	Not applicable.
Solubility (Water):	insoluble
Solubility (Other):	Soluble in: mineral acids
Partition Coefficient:	Not applicable.
Relative Evaporation Rate (Ether = 1):	Not applicable.
Minimum Ignition Temperature (Deg C):	Not applicable.
Minimum Ignition Energy (mJ):	Not applicable.
Bulk Density (g/ml):	0.95 approx
Vapour Density (Air= 1):	Not applicable.
Viscosity (mPa.s):	Not applicable.

---

## 10. STABILITY AND REACTIVITY

Hazardous Reactions:	See Process Hazards section for hazards associated with the discharged material resulting from its intended use.
Hazardous Decomposition Product(s):	None known.

---

## 11. TOXICOLOGICAL INFORMATION

### Inhalation

Unlikely to be hazardous by inhalation unless present as a dust. High concentrations of dust may be irritant to the upper respiratory tract.

High concentrations of very finely divided dust may produce symptoms of 'metal fume fever'. This condition is characterised by influenza type symptoms occurring a few hours after exposure and lasting up to 48 hours.

### Skin Contact

Non-irritant following a single application to rabbit skin.

Repeated or prolonged skin contact may result in mild irritation.

### Eye Contact

Dust may cause irritation.

### Ingestion

Oral Median Lethal Dose >2000mg/kg (rat)

Low oral toxicity, but ingestion may cause irritation of the gastrointestinal tract. May cause nausea, vomiting and diarrhoea.

### Long Term Exposure

No information available.

---

**PRODUCT NAME:** 'PURASPEC' 1157

---

## 12. ECOLOGICAL INFORMATION

### Environmental Fate and Distribution

The product is essentially insoluble in water.

### WGK number

WGK 2 (according to VwVwS, Annex 4)

---

## 13. DISPOSAL CONSIDERATIONS

Dispose of through the metal recovery industry or through the 'Johnson Matthey Catalyst Care' programme. Disposal should be in accordance with local, state or national legislation.

Used catalyst may have different hazards or properties from the new material. This safety data sheet does not apply to the used catalyst.

---

## 14. TRANSPORT INFORMATION

Not Classified as Hazardous for Transport.

---

## 15. REGULATORY INFORMATION

Not Classified as Hazardous to Users.

---

## 16. OTHER INFORMATION

### Risk Phrases used in the MSDS

R22 Harmful if swallowed.

This data sheet was prepared in accordance with Directive 2001/58/EC.

The following sections contain revisions or new statements: 9.

**PRODUCT NAME:** 'PURASPEC' 1157

---

Information in this publication is believed to be accurate and is given in good faith, but it is for the Customer to satisfy itself of the suitability for its own particular purpose. Accordingly, Johnson Matthey plc gives no warranty as to the fitness of the Product for any particular purpose and any implied warranty or condition (statutory or otherwise) is excluded except to the extent that such exclusion is prevented by law. Freedom under Patent, Copyright and Designs cannot be assumed.

It is the policy of Johnson Matthey Catalysts to update this information regularly. You are therefore advised to check that this sheet is the most recent issue.

'PURASPEC' is a trade mark of the Johnson Matthey Group of Companies.

'Catalyst Care' is a service mark of the Johnson Matthey Group of Companies.

Johnson Matthey Catalysts is a trading division of Johnson Matthey plc, Registered Office : 2-4 Cockspur Street, Trafalgar Square, London, SW1Y 5BQ.

Product name: THERMINOL® 55 Heat transfer fluid  
Solutia Inc. Material Safety Data Sheet  
Reference Number: 000000000196

Page 1 / 7  
Date: 05/15/2006  
Version 5.1/E

# Solutia Inc.

## Material Safety Data Sheet

### 1. PRODUCT AND COMPANY IDENTIFICATION

Product name: THERMINOL® 55 Heat transfer fluid

Reference Number: 000000000196

Date: 05/15/2006

Company Information:

#### United States:

Solutia Inc.  
575 Maryville Center Drive, P.O. Box 66760  
St. Louis, MO 63166-6760  
Emergency telephone: Chemtrec: 1-800-424-9300  
International Emergency telephone: Chemtrec: 703-527-3887  
Non-Emergency telephone: 1-314-674-6661

#### Canada:

Solutia Canada Inc.  
6800 St. Patrick Street  
LaSalle, PQ H8N 2H3  
Emergency telephone: CANUTEC: 1-613-996-6666  
Non-Emergency telephone: 1-314-674-6661

#### Mexico:

Solutia MEXICO, S. DE R.L. DE C.V.  
Prol. Paseo de la Reforma 2654  
Local 501, Piso-5  
Col. Lomas Altas  
11950 Mexico, D.F.  
Emergency telephone: SETIQ: (in Mexico) 01-800-002-1400  
Non-Emergency telephone: (in Mexico) 01-55-5259-6800

#### Brazil:

Solutia Brazil Ltd.  
Avenue Carlos Marcondes, 1200  
CEP: 12241-420-São José dos Campos/SP-Brazil  
Emergency telephone: 55 12 3932 7100 (PABX)  
Non-Emergency telephone: 55 11 3365 1800 (PABX)

### 2. HAZARDS IDENTIFICATION

#### EMERGENCY OVERVIEW

Form: liquid  
Colour: clear to yellow  
Odour: characteristic

#### WARNING STATEMENTS

##### CAUTION!

May cause eye irritation  
May cause skin irritation  
May cause respiratory tract irritation

#### POTENTIAL HEALTH EFFECTS

Likely routes of exposure: eye and skin contact

	inhalation
Eye contact:	Moderately irritating to eyes.
Skin contact:	Moderately irritating to skin. No more than slightly toxic if absorbed. Repeated contact may cause a drying, solvent like action on the skin.
Inhalation:	Elevated processing temperatures may cause release of vapours which are irritating if inhaled. Significant adverse health effects are not expected to develop under normal conditions of exposure. No more than slightly toxic if inhaled.
Ingestion:	No more than slightly toxic if swallowed. Significant adverse health effects are not expected to develop if only small amounts (less than a mouthful) are swallowed.
Signs and symptoms of overexposure:	headache dizziness/incoordination nausea/vomiting loss of consciousness vertigo confusion anxiety laboured breathing drowsiness

Refer to Section 11 for toxicological information.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Components</u>	<u>CAS No.</u>	<u>Average concentration</u>	<u>Concentration range</u>	<u>Units</u>
C14-30-alkylaromatic derivatives	68855-24-3	100.0		%

### 4. FIRST AID MEASURES

If in eyes:	Immediately flush with plenty of water. If easy to do, remove any contact lenses. Remove material from skin and clothing. Get medical attention if irritation persists.
If on skin:	Immediately flush the area with plenty of water. Remove contaminated clothing. Get medical attention. Wash clothing before reuse.
If inhaled:	Remove patient to fresh air. If not breathing, give artificial respiration. If breathing is difficult give oxygen. Remove material from eyes, skin and clothing.
If swallowed:	Immediate first aid is not likely to be required.

Product name: THERMINOL® 55 Heat transfer fluid  
Solutia Inc. Material Safety Data Sheet  
Reference Number: 000000000196

Page 3 / 7  
Date: 05/15/2006  
Version 5.1/E

A physician or Poison Control Center can be contacted for advice.  
Wash heavily contaminated clothing before reuse.

## 5. FIRE FIGHTING MEASURES

Fire point:	218 C	Cleveland Open Cup
Hazardous products of combustion:	carbon dioxide; carbon monoxide (CO); soot; smoke; hydrocarbons	
Extinguishing media:	Water spray, foam, dry chemical, or carbon dioxide	
Unusual fire and explosion hazards:	None known	
Fire fighting equipment:	Firefighters, and others exposed, wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.	
Miscellaneous advice:	This product is not classified as a fire-resistant heat transfer fluid. Precautions to avoid sources of ignitions should be taken.	

## 6. ACCIDENTAL RELEASE MEASURES

Personal precautions:	Use personal protection recommended in section 8.
Environmental precautions:	Keep out of drains and water courses.
Methods for cleaning up:	Contain large spills with dikes and transfer the material to appropriate containers for reclamation or disposal. Absorb remaining material or small spills with an inert material and then place in a chemical waste container. Flush spill area with water.

Refer to Section 13 for disposal information and Sections 14 and 15 for reportable quantity information.

## 7. HANDLING AND STORAGE

### Handling

Avoid contact with eyes, skin and clothing.  
Avoid breathing vapour or mist.  
Keep container closed.  
Use with adequate ventilation.  
Wash thoroughly after handling.  
Precautions against ignitions and fire should be taken with this product.  
Heat transfer fluids are intended for INDIRECT heating purposes ONLY.  
This product has not been approved for food grade use.

Emptied containers retain vapour and product residue. Observe all recommended safety precautions until container is cleaned, reconditioned or destroyed. Do not cut, drill, grind or weld on or near this container. The reuse of this material's container for non industrial purposes is prohibited and any reuse must be in consideration of the data provided in this material safety data sheet.

### Storage

General:	Stable under normal conditions of handling and storage.
----------	---

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne exposure limits: (ml/m3 = ppm)



THERMINOL® 55	No specific occupational exposure limit has been established.
Eye protection:	Wear chemical goggles. Have eye flushing equipment available.
Hand protection:	Wear chemical resistant gloves. Consult the glove/clothing manufacturer to determine the appropriate type glove/clothing for a given application.
Body protection:	Wear suitable protective clothing. Consult the glove/clothing manufacturer to determine the appropriate type glove/clothing for a given application. Wear full protective clothing if exposed to splashes. Wash contaminated skin promptly. Launder contaminated clothing and clean protective equipment before reuse. Wash thoroughly after handling.
Respiratory protection:	Avoid breathing vapour or mist. Use approved respiratory protection equipment when airborne exposure is excessive. Consult the respirator manufacturer to determine the appropriate type of equipment for a given application. Observe respirator use limitations specified by the manufacturer.
Ventilation:	Provide natural or mechanical ventilation to minimize exposure. If practical, use local mechanical exhaust ventilation at sources of air contamination such as processing equipment.

Components referred to herein may be regulated by specific Canadian provincial legislation. Please refer to exposure limits legislated for the province in which the substance will be used.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Flash point:	177 C	Cleveland Open Cup
Autoignition temperature:	343 C	ASTM E-659
Specific gravity:	0.863 - 0.901 @ 25 C	
Boiling range :	340 - 390 C @ 1,013 hPa	
Boiling point :	351 C @ 1,013 hPa	
Water solubility:	1 mg/l @ 25 C	
Kinematic viscosity:	13 - 34.1 mm <sup>2</sup> /s @ 38 C	

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

## 10. STABILITY AND REACTIVITY

Conditions to avoid:	All sources of ignition.
----------------------	--------------------------

Product name: THERMINOL® 55 Heat transfer fluid  
Solutia Inc. Material Safety Data Sheet  
Reference Number: 00000000196

Page 5 / 7  
Date: 05/15/2006  
Version 5.1/E

Materials to avoid: None known  
Hazardous reactions: Hazardous polymerization does not occur.  
Hazardous decomposition products: carbon monoxide (CO); carbon dioxide; soot; smoke; hydrocarbons

## 11. TOXICOLOGICAL INFORMATION

Human experience: Repeated contact may cause a drying, solvent like action on the skin.

This product has been tested for toxicity. Results from Solutia sponsored studies or from the available public literature are described below.

### Acute animal toxicity data

Oral: LD50 , rat, > 15,800 mg/kg , Practically nontoxic following oral administration.  
Dermal: LD50 , rabbit, > 7,940 mg/kg , Practically nontoxic after skin application in animal studies.  
Inhalation: limit test , rat, , , No mortality or signs of toxicity at the highest level achievable.  
Eye irritation: rabbit , Slightly irritating to eyes., 24 h  
Skin irritation: rabbit , Moderately irritating to skin., 24 h  
Repeat dose toxicity: rat , diet, 90 day, , Produced effects on body weight, serum enzymes and/or organ weights in repeat dose studies.  
Target organs affected: kidneys, liver  
Repeat dose toxicity: rat , inhalation, 28 days, , Adverse effects observed in repeat dose studies.  
Target organs affected: blood  
Developmental toxicity: rat, gavage, , No effects on offspring observed in laboratory animals in the presence of maternal toxicity.  
Mutagenicity: No genetic effects were observed in standard tests using bacterial and animal cells.

## 12. ECOLOGICAL INFORMATION

### Environmental Toxicity

Invertebrates: 48 h, EL50 (water accommodated fraction - W.A.F.) Water flea (*Daphnia magna*) > 600 mg/l  
Fish: 96 h, LC50 Rainbow trout (*Oncorhynchus mykiss*) > 100 mg/l  
96 h, LC50 Fathead minnow (*Pimephales promelas*) > 1000 mg/l  
Algae: 96 h, EL50 (water accommodated fraction - W.A.F.) Algae (*Selenastrum capricornutum*) > 1000 mg/l

Product name: THERMINOL® 55 Heat transfer fluid  
Solutia Inc. Material Safety Data Sheet  
Reference Number: 000000000196

Page 6 / 7  
Date: 05/15/2006  
Version 5.1/E

#### Environmental fate

Biodegradation	Modified SCAS (OECD 301A) 1 % Resistant to biodegradation. Modified Sturm (OECD 301B) 4 % Resistant to biodegradation. theoretical CO2 evolution 3 % Resistant to biodegradation.
----------------	--

### 13. DISPOSAL CONSIDERATIONS

US EPA RCRA Status: This material when discarded may be a hazardous waste as that term is defined by the Resource Conservation and Recovery Act (RCRA), 40 CFR 261.24, due to its toxicity characteristic. This material should be analyzed in accordance with Method 1311 for the compound(s) below.

US EPA RCRA hazardous waste number:	D018	Compound/Characteristic:	BENZENE
--	------	--------------------------	---------

Disposal considerations: Incineration

Miscellaneous advice: This product meets the criteria for a synthetic used oil under the U.S. EPA Standards for the Management of Used Oil (40 CFR 279). Those standards govern recycling and disposal in lieu of 40 CFR 260 -272 of the Federal hazardous waste program in states that have adopted these used oil regulations. Consult your attorney or appropriate regulatory official to be sure these standards have been adopted in your state. Recycle or burn in accordance with the applicable standards.  
Solutia operates a used fluid return program for certain fluids under these used oil standards. Contact your Sales Representative for details.  
This product should not be dumped, spilled, rinsed or washed into sewers or public waterways.

### 14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

#### US DOT

Other: Not regulated for transport.

#### Canadian TDG

Other: Not regulated for transport.

#### ICAO/IATA Class

Other: See DOT Information

### 15. REGULATORY INFORMATION

All components are in compliance with the following inventories: U.S. TSCA, Canadian DSL, EU EINECS, Japanese ENCS, Australian AICS, Korean, Phillipine PICCS, Chinese

Canadian WHMIS classification: D2(B) - Materials Causing Other Toxic Effects

Product name: THERMINOL® 55 Heat transfer fluid  
Solutia Inc. Material Safety Data Sheet  
Reference Number: 000000000196

Page 7 / 7  
Date: 05/15/2006  
Version 5.1/E

SARA Hazard Notification:

Hazard Categories Under Title III Rules (40 CFR 370):	Immediate
Section 302 Extremely Hazardous Substances:	Not applicable
Section 313 Toxic Chemical(s):	Not applicable

CERCLA Reportable Quantity:

Not applicable

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulation and the MSDS contains all the information required by the Canadian Controlled Products Regulation.

Refer to Section 11 for OSHA/HPA Hazardous Chemical(s) and Section 13 for RCRA classification.

Safety data sheet also created in accordance with Brazilian law NBR 14725

## 16. OTHER INFORMATION

Product use: Heat transferring agents

Reason for revision: Significant changes to the following section(s):, Section 1

	Health	Fire	Reactivity	Additional Information
Suggested NFPA Rating	1	1	0	
Suggested HMIS Rating:	1	1	0	B

Prepared by the Solutia Hazard Communication Group. Please consult Solutia @ 314-674-6661 if further information is needed.

TM, ® is a registered trademark of Solutia Inc.

SOLUTIA is a trademark of Solutia Inc.

Responsible Care® is a registered trademark of the American Chemistry Council.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Solutia Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Solutia Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

MSDS Number: T5382 \* \* \* \* \* Effective Date: 05/17/01 \* \* \* \* \* Supersedes: 06/02/98

**MSDS**

**Material Safety Data Sheet**

From: Mallinckrodt Baker, Inc.  
222 Red School Lane  
Phillipsburg, NJ 08865



Mallinckrodt  
CHEMICALS



24 Hour Emergency Telephone: 800-859-2151  
CHEMTREC: 1-800-424-9300

National Response in Canada  
CANUTEC: 613-996-6666

Outside U.S. and Canada  
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

## TRIETHYLENE GLYCOL

### 1. Product Identification

**Synonyms:** Ethanol, 2,2'-[1,2-ethanediylbis(oxy)]bis-; triglycol; ethylene glycol dihydroxy-diethyl ether

**CAS No.:** 112-27-6

**Molecular Weight:** 150.20

**Chemical Formula:** C<sub>6</sub>H<sub>14</sub>O<sub>4</sub>

**Product Codes:**

J.T. Baker: W660

Mallinckrodt: 2735

### 2. Composition/Information on Ingredients

Ingredient	CAS No	Percent
Hazardous		
-----	-----	-----
-----		
Triethylene Glycol	112-27-6	90 - 100%
Yes		

### 3. Hazards Identification

## Emergency Overview

---

**WARNING! CAUSES EYE IRRITATION. MAY CAUSE SKIN IRRITATION.**

**J.T. Baker SAF-T-DATA<sup>(tm)</sup> Ratings** (Provided here for your convenience)

---

Health Rating: 0 - None

Flammability Rating: 1 - Slight

Reactivity Rating: 0 - None

Contact Rating: 1 - Slight

Lab Protective Equip: GOGGLES; LAB COAT

Storage Color Code: Orange (General Storage)

---

## Potential Health Effects

---

### Inhalation:

No adverse health effects expected from inhalation.

### Ingestion:

No adverse effects expected.

### Skin Contact:

Prolonged exposure may cause skin irritation.

### Eye Contact:

Splashing in eye causes irritation with transitory disturbances of corneal epithelium.

However, these effects diminish and no permanent injury is expected. Vapors are non-irritating.

### Chronic Exposure:

Possible skin irritation.

### Aggravation of Pre-existing Conditions:

No information found.

---

## 4. First Aid Measures

### Inhalation:

Remove to fresh air. Not expected to require first aid measures.

### Ingestion:

If large amounts were swallowed, give water to drink and get medical advice.

**Skin Contact:**

In case of contact, immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Call a physician if irritation develops..

**Eye Contact:**

If splash occurs, immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Call a physician.

---

## 5. Fire Fighting Measures

**Fire:**

Flash point: 177C (351F) CC

Autoignition temperature: 371C (700F)

Flammable limits in air % by volume:

lcl: 0.9; ucl: 9.2

Slight fire hazard when exposed to heat or flame.

**Explosion:**

Above the flash point, explosive vapor-air mixtures may be formed.

**Fire Extinguishing Media:**

Water spray, dry chemical, alcohol foam, or carbon dioxide. Water or foam may cause frothing.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

## 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer!

---

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from heat, ignition sources and oxidizing agents. Protect from freezing. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

## 8. Exposure Controls/Personal Protection

### **Airborne Exposure Limits:**

None established.

### **Ventilation System:**

Not expected to require any special ventilation.

### **Personal Respirators (NIOSH Approved):**

Not expected to require personal respirator usage.

### **Skin Protection:**

Wear protective gloves and clean body-covering clothing.

### **Eye Protection:**

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

## 9. Physical and Chemical Properties

### **Appearance:**

Clear, colorless liquid.

### **Odor:**

Odorless.

### **Solubility:**

Miscible in water.

### **Specific Gravity:**

1.1274 @ 15C/4C

### **pH:**

No information found.

### **% Volatiles by volume @ 21C (70F):**

100

### **Boiling Point:**

285C (545F)

### **Melting Point:**

-5C (23F)



**Vapor Density (Air=1):**

5.17

**Vapor Pressure (mm Hg):**

< 0.01 @ 20C (68F)

**Evaporation Rate (BuAc=1):**

0.01

---

## 10. Stability and Reactivity

### **Stability:**

Stable under ordinary conditions of use and storage. Hygroscopic.

### **Hazardous Decomposition Products:**

Carbon dioxide and carbon monoxide may form when heated to decomposition.

### **Hazardous Polymerization:**

Will not occur.

### **Incompatibilities:**

Strong oxidizers.

### **Conditions to Avoid:**

Heat, flames, ignition sources and incompatibles.

---

## 11. Toxicological Information

Oral rat LD50: 17 gm/kg; investigated as a reproductive effector.

-----\Cancer Lists\-----			
-----			
Ingredient Category	---NTP Carcinogen---		IARC
	Known	Anticipated	
-----			
Triethylene Glycol (112-27-6)	No	No	
None			

---

## 12. Ecological Information

### **Environmental Fate:**

When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is not expected to evaporate significantly. When released into water, this material is expected to readily biodegrade. When released into water, this

material is not expected to evaporate significantly. This material has a log octanol-water partition coefficient of less than 3.0. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life of less than 1 day.

#### Environmental Toxicity:

This material is expected to be slightly toxic to aquatic life. The LC50/96-hour values for fish are between 10 and 100 mg/l.

---

### 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

### 14. Transport Information

Not regulated.

---

### 15. Regulatory Information

```
-----\Chemical Inventory Status - Part 1\-----
-----
Ingredient                                     TSCA  EC   Japan
Australia
-----
Triethylene Glycol (112-27-6)                 Yes  Yes  Yes
Yes
```

```
-----\Chemical Inventory Status - Part 2\-----
-----
Ingredient                                     Korea  DSL  --Canada--  NDSL
Phil.
-----
Triethylene Glycol (112-27-6)                 Yes   Yes   No
Yes
```

```
-----\Federal, State & International Regulations - Part 1\-----
-----
-SARA 302-          -----SARA
313-----
```

Ingredient Chemical Catg.	RQ	TPO	List
-----	-----	-----	-----
Triethylene Glycol (112-27-6)	No	No	No

-----\Federal, State & International Regulations - Part 2\-----

TSCA- Ingredient	CERCLA	261.33	8(d)
-----	-----	-----	-----
Triethylene Glycol (112-27-6)	No	No	No

Chemical Weapons Convention: No      TSCA 12(b): No      CDTA: No  
 SARA 311/312: Acute: Yes      Chronic: No      Fire: No      Pressure: No  
 Reactivity: No      (Pure / Liquid)

**Australian Hazchem Code:** None allocated.

**Poison Schedule:** None allocated.

**WHMIS:**

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: 1 Flammability: 1 Reactivity: 0

**Label Hazard Warning:**

WARNING! CAUSES EYE IRRITATION. MAY CAUSE SKIN IRRITATION.

**Label Precautions:**

Avoid contact with eyes, skin and clothing.

Wash thoroughly after handling.

**Label First Aid:**

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Call a physician.

**Product Use:**

Laboratory Reagent.

**Revision Information:**

No changes.

**Disclaimer:**

\*\*\*\*\*

\*\*\*\*\*

**Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.**

\*\*\*\*\*

\*\*\*\*\*

**Prepared by: Environmental Health & Safety**

**Phone Number: (314) 654-1600 (U.S.A.)**

**METITO**

# MATERIAL SAFETY DATA SHEET



## SECTION 1 - BASIC INFORMATION

Manufacturers Name : <b>METITO - FZE</b>	Emergency Telephone : 971-06 -5563011 971-06 -263177
Postal Address: <b>Metito (Overseas) Ltd.</b> P.O. Box 22701, SHARJAH, UNITED ARAB EMIRATES.	
Product Name and Synonyms <b>M-140</b>	Application <b>Corrosion Inhibitor</b>
Hazard Symbol (if any) <b>CORROSIVE</b>	Metito Safety Category : <b>C - Highly Alkaline</b>
U.N. No.: <b>1760 ; Corrosive Substance Liquid , N.O.S.</b>	IMDG Class : <b>8 ; Corrosive</b>
Risk Phrases (if any) <b>Causes severe burns</b>	
Safety Phrases (if any) <b>Keep out of reach of children Take off immediately all contaminated clothing Wear suitable protective clothing, gloves and eye/face protection. After contact with skin, wash immediately with plenty of water. In case of contact with eyes, rinse immediately with plenty of clean water and seek medical advice.</b>	

## SECTION 2 - HAZARDOUS INGREDIENTS

Hazardous Substance	% W/W	TLV (Units)
Sodium Metasilicate	20-30	No data available

## SECTION 3 - PHYSICAL DATA

Appearance & Odour	Clear, colourless odourless liquid.		
Boiling Point	≥ 100°C	Specific Gravity (H <sub>2</sub> O=1)	1.36 - 1.37
Vapour Pressure(mm Hg.) 13°C	As water	%Volatile by volume	70-80
Vapour Density (Air=1):	As water	Evaporate Rate(H <sub>2</sub> O=1)	As Water
Solubility in Water:	Complete	pH as supplied.	12.0 - 13.0

## SECTION 4 - FIRE & EXPLOSION HAZARD DATA

Flash Point (Method Used)	: Non-flammable
Extinguishing Media	: Water spray, carbon dioxide or dry chemical.
Fire Fighting Procedures	: When chemicals are involved in a general fire, large volumes of black smoke or toxic fumes can be liberated, even if the substance is not classified as flammable. Fire fighters should ensure necessary precautions are taken by wearing breathing apparatus, especially if volumes involved are large. Use water to keep container cool.
Unusual Fire & Explosion Hazard	: None.

#### SECTION 5 - HEALTH HAZARD DATA

Threshold Limit Value : No data available

Effect of Overexposures : This product, and concentrated solutions of it are corrosive to skin, eyes, respiratory system and especially to mucous membranes.

Emergency & First Aid Procedures : Avoid ingestion of this product, or concentrated solution of it. In the event of accidental ingestion, drink copious quantities of water. Do not induce vomiting. Seek medical attention at the earliest opportunity. In the event of skin or eye contact, rinse continuously with fresh water for at least 15 minutes. Seek medical advice quickly, particularly in the event of eye contact.

#### SECTION 6 - REACTIVITY DATA

Stability : Stable

Conditions to avoid : See general comments regarding storage in (9) below.

Incompatible materials : Acids(category D materials)

Hazardous decomposition products : None

Hazardous polymerisation : None

Conditions to avoid : See general comments regarding storage in (9) below

#### SECTION - 7 SPILL OR LEAK PROCEDURES

Steps to be taken if material is released or spilled. : Rinse area affected thoroughly with plenty of cold water to foul sewer or absorb with sand or absorbent granules and dispose of safely.

Waste disposal method : Rinse small quantities to drain. Large quantities should be disposed of in accordance with local authority regulations.

#### SECTION - 8 SPECIAL PROTECTION INFORMATION

Respiratory Protection(Incl.Type) : None

Ventilation Local Exhaust : N/A

Special : N/A

Mechanical (General) : N/A

Other : N/A

Protective gloves : Butyl Rubber or PVC Eye Protection : Goggles and/or face shield

Other protective equipment : Overalls and protective apron.

#### SECTION 9 - HANDLING & STORAGE

Precautions to be taken in handling an storing : Ensure that the operator is fully informed and familiar with the use of the product. Do not eat, drink or smoke when using chemicals. Avoid eye contact by the use of suitable protective equipment. Store in the container provided and ensure that it is closed when not in use. Avoid storing near direct heat or in direct sunlight. Do not stack more than two high for extended periods. Ensure the containers are stored away from thoroughfares where they can be accidentally damaged by vehicles, fork lift trucks, etc. Do not store in temperatures below 0°C or above 40°C for prolonged periods. This product is caustic and must therefore be used carefully, and in strict accordance with instructions. Avoid ingestion of or skin/eye contact with neat or diluted product. Gloves are essential for skin and eye protection. If taps are fitted to the container, ensure they are of plastic construction.

Metito - FZE  
Post Box No. 22701,  
Sharjah,  
United Arab Emirates.

LICENCE NO. 023

## MATERIAL SAFETY DATA SHEET

### *SULPHURIC ACID*

#### (1) MATERIAL IDENTIFICATION & USES:-

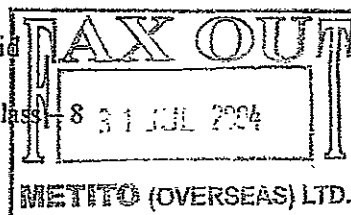
- |     |                            |  |
|-----|----------------------------|--|
| i   | Material Name / Identifier | 98% Sulphuric Acid   |
| ii  | Manufacturer               | Suhail Chemical Industries LLC<br>P.O.Box: 198, Falaj Al Qabail<br>Sohar – 322,<br>Sultanate of Oman.<br>Tel: (968) 850963 / 850995<br>Fax: (968) 851893           |
| iii | Product Uses               | Used for making phosphatic fertilizers, in petroleum refining, iron and steel industry, textiles, paints and pigments, rayons, explosives, lead acid batteries etc |

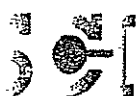
#### (2) CHEMICAL IDENTITY:-

- |     |                         |                                      |
|-----|-------------------------|--------------------------------------|
| i   | Chemical Name           | Sulphuric Acid                       |
| ii  | Chemical Classification | Inorganic                            |
| iii | Synonyms                | Oil of Vitriol                       |
| iv  | Trade Name              | Sulphuric Acid (98% Technical Grade) |
| v   | Chemical Formula        | H <sub>2</sub> SO <sub>4</sub>       |
| vi  | CAS No                  | 7664-93-9                            |
| vii | UN Number               | 1830                                 |

#### (3) REGULATED IDENTIFICATION:-

- |     |                            |                     |
|-----|----------------------------|---------------------|
| i   | Shipping Name              | Sulphuric Acid      |
| ii  | Codes / Label              | Corrosive / Class 8 |
| iii | Hazchem                    | 2 P                 |
| iv  | Hazardous Waste I D Number | 16                  |





**(4) HAZARDOUS INGREDIENTS:-**

- i. Sulphurtrioxide (SO<sub>3</sub>) : CAS No. 7446-11-9

**(5) PHYSICAL & CHEMICAL PROPERTIES:-**

- i. Appearance : Colourless / Light Grey  
ii. Physical State : Oily Liquid (Hygroscopic)  
iii. Odour : Odourless  
iv. Boiling Point : 330°C  
v. Melting Point / F. Point : 3°C  
vi. Vapour Pressure @ 35°C : 1 mm of Hg @ 145°C  
vii. Solubility in water @ 30°C : Soluble  
Others : Soluble in ethyl alcohol and ethyl ether  
viii. Specific Gravity @ 15°C : 1.84  
ix. Ph : < 1

**(6) FIRE AND EXPLOSION HAZARD DATA:-**

- i. Flammability : Nil  
ii. Means of Extinguisher : Nil  
iii. Flash Point : Not Pertinent  
iv. Lower Explosive Limit : Not Pertinent  
v. Auto Ignition Temperature : Not Pertinent  
vi. TDG Transport of Dangerous Goods Flammability : Not Pertinent  
vii. Upper Explosive Limit : Not Pertinent  
viii. Flash Point : Nil  
ix. Explosion Sensitivity to Impact : Stable  
x. Explosion Sensibility to Static Electricity : Stable





- xi. Hazardous Polymerisation : Will not Occur
- xii. Combustible Liquid : No
- xiii. Explosive Material : No, But Sulphuric Acid may generate hydrogen inside the drum tank or metal storage tanks. Because of very explosive nature of hydrogen and air mixture, NO open light and spark should be permitted near the container of Sulphuric Acid.
- xiv. Corrosive Material : Yes, Highly corrosive in nature at concentration below 95%.
- xv. Oxidiser : Powerful oxidiser.
- xvi. Phyrophonic Material : No
- xvii. Organic Peroxide : No
- xviii. Extinguish Media : Use water spray to cool fire exposed (external shell side of) container from a distance. Fires involving small amounts of combustible ignited by contact with Sulphuric Acid can be smothered with dry chemical, CO<sub>2</sub> or foam.

**(7) REACTIVITY DATA:**

- i. Chemical Stability : Stable. Do not add water to container, as the reaction is violent.
- ii. In compatibility with other material : Alkali and active metals, water, chlorates, perchlorates, permanganate, picrates, carbides, powdered metals, phosphorous, combustible material etc.
- iii. Reactivity : Strongly corrosive, miscible with water in all proportions. Very reactive, dissolves most metals. Extremely hygroscopic. Concentrate acid oxidises, dehydrates, or sulphonates most organic compounds. Great caution in mixing with water due to heat evolution that causes spattering.
- iv. Hazardous Reaction Products : Dangerous reaction with hydro chloric acid to release HCL gas.  
  
Strong acid gas fumes of SO<sub>3</sub> gas on heating.

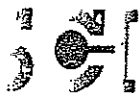


**(8) HEALTH HAZARD DATA:-**

- i. Routes of Entry : Skin, Eyes, Inhalation & Ingestion
- ii. Effects of Exposure Symptoms : Skin – Burning, charring and deep ulceration, deformation
- Eyes – Causes severe damage, even blindness.
- Inhalation – Results in coughing, choking, sensation, irritation to nose and lungs. Chronic bronchitis, pulmonary edema.
- Ingestion – Causes burn in mouth and digestive tract. Stomach burns, gastric perforation and even death.
- iii. Emergency Treatment : Eyes & Skin – Flush with plenty of running water for 15 minutes. Remove contaminated clothing. Seek medical aid immediately.
- Inhalation – Remove the victim to fresh air area. Keep him warm. Start artificial respiration if breathing stops.
- Ingestion – Have the victim drink milk or milk of magnesia. Do not induce vomiting. Give medical attention immediately.
- iv. Toxicological Properties : TLV - 1 mg/m<sup>3</sup>  
STEL - 3 mg/m<sup>3</sup>
- v. Permissible Exposure Limit : Oral LD 50 2.1 g/kg (rats)  
LC 50 510 mg/m<sup>3</sup>

**(9) PREVENTIVE MEASURES:-**

- i. Personnel Protective Equipment : Avoid contact with liquid or vapours.
- Provide protective acid resistance suit.
- Normal Neoprene coat, rubber gum boots.
- Artificial respiration / use gas mask with appropriate filter or SCBA.
- Rubber hand gloves, face shield and helmet.
- For eyes protection – plastic closed type safety goggles.
- Protective Equipment – Eye washer, sprinkler, quick acting drench shower, impervious clothing.

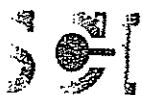


**(10) HANDLING & STORAGE PRECAUTIONS:-**

- i. Handling & Storage Precautions : Concentrated Sulphuric Acid stored in mild steel tanks.  
Diluted Sulphuric Acid to be stored in rubber lined steel tanker or FRP tanks.  
Use Teflon / mechanical seal pumps for liquid transfer operation.  
Never pour water in to acid. When diluting, always pour acid into water.
- ii. Handling Precaution : Use Acid proof PPE while handling.  
Never use air pressure to empty carboys.  
Never handle carboys by the cap / neck.  
Carboys should not be carried on shoulders.  
Be sure caps are fastened before moving either filled or empty carboys.  
Carboys should never be 'walked' on bottom edges – use hand truck.  
Empty carboys should be thoroughly washed with before being sent out.  
Naked carboys / bottles should never be moved or transported except when packed in suitable boxes / crate.  
Glass carboys containing acid should not be stored one on the top of another.  
Glass / plastic container should be adequately protected against impact.

**(11) EMERGENCY & FIRST AID:-**

- i. Fire Extinguishing Media : Not Flammable
- ii. Fire : Special procedure – keep container cool by spraying water if exposed to fire.
- iii. Unusual Hazards : Flammable Gas (Hydrogen) may be produced on contact with metals.



iv. Exposures & First Aid Measures.

: Inhalation – Remove the victim to fresh air area. Start artificial respiration, if breathing stops. Keep him warm.

Ingestion – Have the victim drink milk or milk of magnesia. Do not induce vomiting.

Eyes & Skin – Wash plenty of running water for 15 minutes and hold eyelids open. Give immediate medical attention for all exposures.

Antidotes / Dosages – Lime Water

**(12) DISPOSAL CONSIDERATION:-**

i. Spills

: Steps to be taken – Stop the flow of material if possible (without risk). Do not use metal containers for spilled liquid and cover spills with dry sand or earth. Carefully scoop up the slurry and neutralise with soda ash, bicarbonate and lime (10 – 12%) or lime stone

ii. Waste Disposal Method

: Seal all wastes in vapour tight plastic bags for disposal. Dispose of in accordance with all applicable local state and federal regulations.

**(13) ADDITIONAL INFORMATION:-**

i. Transportation Information

: Transportation through Road Tankers – Emergency information panel should be affixed on tankers carrying Sulphuric Acid with UN Number, HAZCHEM code, Emergency telephone number, label identifying the corrosive hazard of Sulphuric Acid and Trem cards must carry with tanker driver along with PPE and the instructions should be written in the known language of the place of despatch, transit and destinations.

DOT Proper Shipping Name : Sulphuric Acid  
DOT Class : 8  
DOT ID Number : UN 1830  
DOT Packing Group : II  
IMCO Proper Shipping Name : Sulphuric Acid  
IMCO UN Number : 1830  
IMCO UN Class : 8  
IMDG Code Page No. : 8230  
Ems Mo. : 8-06  
MFAG Table No. : 700

**Important:** Read this MSDS before handling and disposing of this product and pass this information on to employees, customers, and users of this product.

## MSDS(MATERIAL DATA SHEET) Sodium Bisulfite

---

### General

Synonyms: sodium hydrogen sulfite, sodium acid sulfite, hydrogen sodium sulfite, sodium bisulphite, sodium hydrogen sulphite, sodium acid sulphite, hydrogen sodium sulphite, sulfurous acid sodium salt, hydrogen sulfite sodium

Use:

Molecular formula:  $\text{NaHSO}_3$

CAS No: 7631-90-5

EINECS No:

### Physical data

Appearance: white powder

Melting point: ca. 150 C (decomposes)

Boiling point:

Vapour density:

Vapour pressure:

Density ( $\text{g cm}^{-3}$ ): 1.48

Flash point:

Explosion limits:

Autoignition temperature:

Water solubility: appreciable

### Stability

Stable. Incompatible with strong oxidizing agents, strong acids.

### Toxicology

Harmful if swallowed or inhaled. May cause allergic reaction in sensitive individuals, especially asthmatics. Irritant. Typical TLV/TWA 5 mg/m<sup>3</sup>.

Toxicity data

ORL-RAT LD50 2000 mg kg<sup>-1</sup>

IPR-RAT LD50 650 mg kg<sup>-1</sup>

IVN-RAT LD50 115 mg kg<sup>-1</sup>

Risk phrases

R20 R22 R36 R37 R38.

### Personal protection

Safety glasses, adequate ventilation.

Safety phrases

S26 S36.



## **Material Safety Data Sheet**

### **1. Company Information :**

Company's Contact Address : Arabian Alkali Company (SODA)  
& Phone, fax & E.Mail Nos P.O. Box 12010  
Jubail Industrial City 1961  
Kingdom of Saudi Arabia  
Tel. No. 00966-3-358-3400  
Fax No. 00966-3-358-5536  
E. Mail : soda@causticprills.com

Emergency Contact Nos. : Dial 999 or the nearest hospital number  
for assistance. For specialist advise in  
emergency telephone Jubail (03) 358-3400  
Ext. 100, 110 or 144.

### **2. Product Information :**

Product Name : Anhydrous Caustic Soda  
Alternative name : Sodium Hydroxide  
Cas No. : 001310-73-2  
EEC No. : 215-185-5  
Hazardous Ingredients : Sodium Hydroxide  
Hazardous Identification : Corrosive. Causes severe burns to all  
parts of the body. Will cause deep  
ulceration with subsequent scarring.

### **3. First-Aid Measures :**

Speed is essential in any medical emergency and hence, obtain immediate medical attention from the nearest hospital/medical centre.

- Contact with skin for more than a few seconds will destroy the skin causing a serious chemical burn that will take a long time to heal, and may even leave a permanent scar.
- Contact with eyes for more than a few seconds will destroy the tissues resulting in loss of eye or impaired vision due to scarring.
- Ingestion of Caustic Soda will severely damage the mucous membranes of the throat and deeper tissues. Do not induce vomiting. If the patient is conscious, wash out mouth with water and give 200-300 ml of water to drink.

#### ***4. Fire-Fighting Measures :***

Non-combustible. Can react with some metals generating hydrogen gas with its associated hazards. Reaction with moisture may generate sufficient heat to ignite combustible material.

#### ***5. Accidental Release Measures :***

Ensure suitable personal protection (including respiratory protection) during removal of spillages. Protect against dust. Contain spillages. Transfer to a container for disposal or recovery. Wash the spillage area with water. Spillages or uncontrolled discharges into water courses, drains or sewers must be immediately alerted to the appropriate authorities.

#### ***6. Handling :***

Caustic Soda is highly corrosive and strong irritant. Contact with the skin and eyes or inhalation of Caustic Soda must be avoided under all circumstances while handling the product. Workers should wear full protective clothing at all times, particularly goggles and gloves, while handling Caustic Soda.

## **7. Storage :**

### **Storing Caustic Soda Bags :**

- Keep the palletted caustic bags at all times under full airtight conditions in a cool and dry warehouse, to ensure the product remains stable.
- If outdoor storage is unavoidable, cover the shrink-wrapped pallets with black polythene or tarpaulin to protect from moisture and sunlight.
- Avoid direct exposure to air in order to prevent absorption of moisture and carbon dioxide.
- Avoid direct exposure to sunlight in order to prevent ultra violet degradation of polyethylene.
- Prevent rupture and other damages of packages containing caustic prills.

### **Storing Caustic Soda Drums :**

- Keep the drums upright, preferably indoor, to avoid corrosion of metal by surface water.
- Ensure the drum lids remain tightly closed during storage
- If stored outdoor, protect drums by covering with waterproof sheeting.
- Keep the stock always dry. Moist atmosphere can lead to product contamination.
- Turnover from the stock should be on the basis of first in - first out.

## **8. Exposure Controls / Personal Protection :**

Wear close fitting goggles or full face shield.

Wear suitable protective clothing and gloves

Wear suitable respiratory protective equipment if exposure to levels above the occupational exposure limit is likely.

### **Occupational Exposure Limits**

	<b>LTEL 8hr</b>	<b>TWA</b>	<b>STEL</b>	<b>Time</b>
<b>Hazardous Ingredients</b>	<b>ppm</b>	<b>mg/m3</b>	<b>ppm mg/m3</b>	<b>mins</b>
Sodium Hydroxide	-	-	-	2 - OES*

\*(OES = Occupational Exposure Standard (UK HSE EH40))



### 9. Physical & Chemical Properties :

Form	:	Deliquescent solid, can be in the form of flakes, pellets or sticks.
Colour	:	white
Boiling Point (Deg C)	:	1390
Melting Point (Deg C)	:	318
Solubility (Water)	:	soluble with evolution of heat
Solubility (Other)	:	alcohols, glycerol
Specific Gravity	:	2.13 (water = 1 at 4 Deg. C)
Bulk Density (g/ml)	:	1.175

### 10. Stability & Reactivity :

#### Hazardous Reactions :

Can react violently if in contact with acids and chlorinated hydrocarbons. Highly reactive with aluminium, zinc, lead, tin, and alloys of these metals producing flammable hydrogen gas. Can react violently if in contact with water.

### 11. Toxicological Information :

Dust is severely irritant to the respiratory tract. Effect may vary from irritation of the nasal mucous membrane to severe lung irritation.

Corrosive. May cause severe burns with permanent skin damage which are slow to heal.

Extremely severe irritant / corrosive. May cause severe damage with formation of corneal ulcers and permanent impairment of vision.

Will immediately cause corrosion of and damage to the gastrointestinal tract. Lethal dose for man is approximately 5g.

Long Term Exposure : The severity of acute effects is such that significant repeated or prolonged exposure is unlikely.

### 12. Ecological Information :

**Environmental fate and Distribution**

High tonnage material used in partially contained systems. Solid with low volatility. The substance is soluble in water. The substance does not bioaccumulate.

**Persistence and Degradation**

Sodium Hydroxide degrades readily by reaction with the natural carbon dioxide in the air.

**Toxicity**

Concentrations greater than 10ppm, especially in fresh water, or a pH value equal to or greater than 10.5 may be fatal to fish and other aquatic organisms. Can cause damage to aquatic plants. Can cause damage to vegetation.

**Effect on Effluent Treatment**

Concentrations sufficient to render effluent alkaline may cause damage to effluent treatment organisms.

**13. Disposal Considerations :**

Disposal should be in accordance with local, state or national legislation.

**14. Transportation Information :**

UN No. : 1823  
UN Pack. Group : II

**AIR**

ICAO/IATA Class  
-primary : 8  
UN Packing Group Sea : II

**SEA**

IMDG Class  
-primary : 8  
UN Packing Group Sea : II

**Road / Rail**

ADR/RID Class : 8  
ADR/RID Item No. : 41 (b)  
ADR SIN : 1823

**15. Regulatory Information :**

EEC Classification	:	Corrosive
Hazard Symbol	:	C
Risk Phrases	:	R35 : Causes severe burns.
Safety Phrases	:	S2 : Keep out of reach of children S26 : In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S27 : Take off immediately all contaminated clothing. S37/39 : Wear suitable gloves and eye/face protection.

#### **16. Other Information :**

This data sheet was prepared in accordance with Directive 91/155/EEC.

Information in this publication is believed to be accurate and is given in good faith, but it is for the Customer to satisfy itself of the suitability for its own particular purpose. Accordingly, SODA gives no warranty as to the fitness of the Product for any particular purpose and any implied warranty or condition (statutory or otherwise) is excluded except to the extent that such exclusion is prevented by law. Freedom under Patent, Copyright and Designs cannot be assumed. Any trade marks herein identified are the trade marks of SODA company.

#### Glossary :

OES : Occupational Exposure Standard (UK HSE EH40)  
MEL : Maximum Exposure Limit (UK HSE EH40)

COM : The company aims to control exposure in its workplace to this limit  
TLV : The company aims to control exposure in its workplace to the ACGIH limit  
TLV-C : The company aims to control exposure in its workplace to the ACGIH  
Ceiling limit  
MAK : The company aims to control exposure in its workplace to the German limit  
Sk : Can be absorbed through skin  
Sen : Capable of causing respiratory sensation.